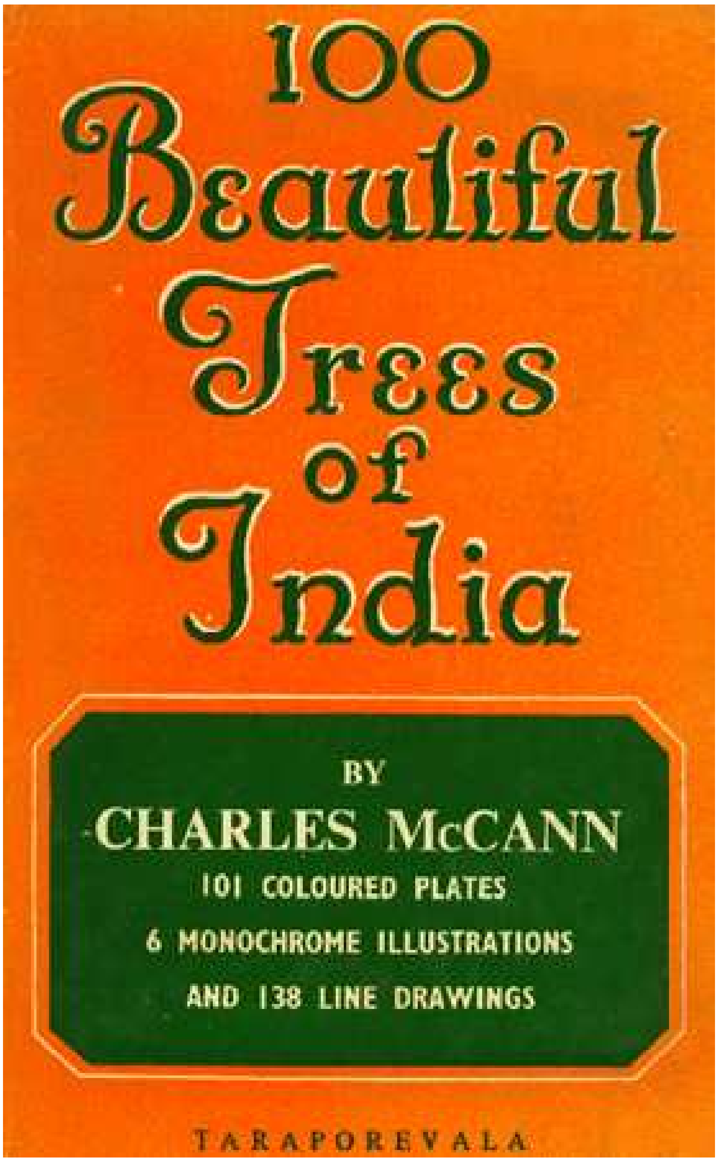


This book fills a definite need, as up to now there has been no cheap and comprehensive book dealing with the common trees of India. Students will find this book of inestimable value on account of its simplicity and the accuracy of its illustrations. Again, the lover of gardening and all interested in plant life will find the book very useful and interesting.

Even for the layman, the identification of common Indian trees has now been made easy by the special key devised by the author. Students-will find it much simpler to use this key than the standard classification tables. All technical terms used have been fully explained and illustrated by the author.

Nobody else could have produced a better book of this kind than Mr. McCann, who was joint-curator of the Bombay Natural History Society. The study of plant life of India has been his life study, and into this book has gone all his enthusiasm, all his love for the subject. McCann is a fine botanist; he is an equally good artist as the coloured and black-and-white illustrations in this book show—every illustration drawn and painted by the author himself from life. Many of the older books contain illustrations that do not agree with nature. Hence the author's great care to sketch only from perfect specimens, diligently collected at the right time from all parts of India. Individual parts of the tree, like leaves, fruit, flowers, etc., have been shown, wherever necessary, making identification, easy and certain. The text is equally accurate and written after painstaking research.

100 Beautiful Trees of India is the only book of its kind—so comprehensive, accurate as regards text and illustrations, and so easy to use. A work that will help one and all to identify and appreciate the common trees of this country, trees found in gardens, about town's and in the villages.

100
BEAUTIFUL TREES OF INDIA

A DESCRIPTIVE & PICTORAL HANDBOOK

BY

CHARLES McCANN

(First Published 1959)

PREFACE

IT is said that, 'Dripping water even wears away a stone,' and this work is mainly the result of a similar action: the repeated enquiries by friends and others, for a popular book dealing with the common, everyday trees about towns, villages, and in the jungle. These constant enquiries certainly indicated that there is certainly room for a 'best seller' on the subject. A great difficulty is the selection of the trees to be included in such a book. India already has a large number of indigenous species, and the number has been greatly enhanced by the introduction of numerous exotics from all quarters of the globe, either for their beauty or their utility. The 'foreigners' make the task a little more difficult owing to the absence of popular names, or on account of their rarity in the country. However, it required more than enquiries to divert me from the road of research to embark on such an undertaking. It required a 'war' and its consequent 'Micawberian' complaint! Nevertheless, if the work justifies its existence, and contributes to the study of Botany in India, it will be a happy diversion from the path of research—the narrowing towards specialization for the favoured few.

The assigning of popular names is a serious difficulty. In many instances I have adopted the commonest vernacular name, rather than coin a new one as the popular 'English' name, or translate the scientific, Latin, name into English, as is often done, resulting in a clumsy phrase. An Indian tree should bear its common Indian name just as foreign trees go by their local names in their own land. However it is a point beset with many difficulties. In time the work may be translated into the various vernaculars, in which case I would request the translators to retain the common names as given, so that, in time, a uniform nomenclature may arise. In some cases it is obvious that a vernacular name will have to be coined., but such an endeavour is beyond me. As matters are at the present, the botanist, the student, and the layman are wandering in a maze.

The descriptions I have adapted from various floristic works. Where 1 deemed it necessary, I have added to the existing descriptions. The notes on gardening have been gathered from various publications. And for the economic uses I have had to rely largely on Watt's "Dictionary of Economic Products."

In the production of the illustrations, I have tried to produce them as accurately as possible from living specimens, and in so doing, I have often sacrificed art for accuracy. In the case of deciduous trees, those which are not in flower and leaf at the same time, I have invariably depicted the leaves in yellow, oranges, and other autumnal tints instead of the usual green, so that the reader sees the fact at a glance. With compound leaves, I have usually omitted the greater portion of the leaflets so as not 'to overcrowd the picture, and at the same time to leave room for details of floral organs. In these instances the details are often enlarged.

Finally, I must thank those who spurred me on to undertake this work, especially Mr. F. E. Bharucha who always gave me the greatest encouragement, and Mr. J. H. Taraporevala for undertaking such a venture.

C. McCann.

INTRODUCTION

THE study of plant life is a department of Natural History, commonly and scholastically referred to as Botany. This subject is often believed to be as 'dry-as-dust' and therefore of little interest to the average man—a subject best left to the cynics who find no pleasure in life; in fact, a botanist is very often considered a 'dry-as-dust gentleman' poring over his herbarium and boring through it like a wood-borer!

The department of botany is an enormous field, and, like other unwieldy subject, is divided into different branches. The most important branch is that of Systematic Classification, for without it, it would be impossible to proceed. The Systematist, for this is the name of the 'keeper' of this branch, must set the plant world in order. It is he who divides the Vegetable Kingdom into classes, orders, and families, and finally into genera and species, but he himself may know little or nothing of the functions and life of the plants he has classified; in fact, he may never have seen a living specimen of the many plants described by him! Then we have the Physiologist who endeavours to study the functions of the various plants and their organs in the light of the researches made by the systematist. There is then the Specialist who has an exhaustive knowledge of perhaps a single group or genus. His knowledge is often deep, but is generally narrowed to the limits of his special subject. There are several other divisions of the subject, too numerous to retail here. Lastly, however, we may refer to the all-round botanist, or field-botanist, who, although his knowledge may not run deep, like that of the specialist, in all likelihood derives more pleasure out of the subject as a whole, since he is better able to see the wonders and infinite variety silently displayed by the Vegetable Kingdom, and to appreciate its true position in the general scheme of life on our planet. He has ample opportunity of studying plants in their natural environment, and of noticing their habits, likes, or dislikes, and their special peculiarities, which are as infinitely varied as those manifest in the Animal Kingdom.

Plant life usually appeals to the layman either for its beauty or from the utilitarian point of view, but, apart from the 'admirers' and 'utilitarian,' most people give plants the go by. From the layman's point of view, one of the drawbacks, in India particularly, is the almost complete lack of popular works on the subject. Most of the literature available requires a fore-knowledge of the subject before it can be used to any advantage. It is this drawback that is mainly responsible for many in search of a hobby, setting aside botany as a subject without vital interest. However, plant life is very important indeed; our very existence is dependent on the existence and continuance of the Vegetable Kingdom—it produces the vital oxygen so necessary to every organism; it provides food, either directly or indirectly, to the whole of the Animal Kingdom, including Man, and he, in his great advancement, has pressed plant tissues and their chemical contents into all manner of use. Thus it becomes clear that the Animal World, and Man himself, owe much to the silent 'immovable' plants, and it is to our advantage to know more about them and to conserve them.

Like every profession, botany has of necessity developed its own terminology—the 'bugbear' of the uninitiated—some of which appears, and is, very ponderous. Such terminology, however, cannot be entirely avoided; or descriptions would become unnecessarily long. Accordingly, the layman must make an effort -to con a few of the terms. To assist the layman, I shall give below a very brief explanation of the commonest morphological terms used in most popular and scientific works. For a fuller understanding of the terms he must turn to the diagrammatic illustrations.

MORPHOLOGY

What is Morphology? The appearance of the term is perhaps more formidable than the subject: it is merely a term which covers the study of the various external organs of a plant, or animal, mainly for the purpose of classification.

A plant may be roughly divided into roots, stem, leaves, flowers, and fruit (seed). These various organs vary much in detail and origin, and on this account the popular and scientific conceptions are often not in accord. A good example of this difference of terminology arises in the case of the Cashew. The true fruit is the familiar Cashew-nut, while the edible, succulent portion is in reality the enlarged flower-stalk! This is only one example, but there are very many more such 'errors,' but the reader will see them for himself as he advances in the knowledge of the subject. It is therefore evident that the student should get a clear idea of the various organs of the plant he is dealing with. Now we shall examine the organs, commencing with the roots, and climbing the tree till we reach the flower and fruit.

Roots:

The layman usually has a fairly clear notion as to what is ordinarily termed a root, but technically he may fall into a trap. Let us see! Most people would naturally refer to a potato as a root, but in reality it is a stem transformed into an underground storage organ—the 'starch bank' of the plant.

It would occupy too much space to describe all the various forms of roots, and so I must confine my remarks to the most common forms. The root is, so to speak, the mouth of the plant, and on this account a plant may be said to grow 'upside down'— it buries its mouth in the ground, while its 'body and tail' it waves to the heavens! The commonest form of root is the string-or rope-like structure most commonly seen when a plant is uprooted. These fibrous portions absorb the simple chemical contents of the soil necessary for their development. This material is passed on through the stem and branches, and finally reaches the leaves, where, under the influence of sun-light, the simple chemical substances are converted into more complex substances to serve as the 'food' of the plant. Besides acting as the procurators of the food materials, the roots serve as organs of anchorage, and also as 'store-houses' for reserve materials. It is when the roots act as 'starch and reserve banks' that they assume many different shapes: there is the conical root of the carrot; the spindle-shaped. fusiform, root of the beet; while the root of the radish may be globular or conical. The root of the turnip is called napiform, and that of the dahlia tuberous—but the latter must not be confused with a true tuber, such as the potato, which is an underground stem. A root may appear like a string of beads in which case it is referred to as moniliform. In plants which grow on trees without deriving any nourishment from them (such plants are known as epiphytes) the roots hang down and are called aerial-roots. Some of the orchids are good examples of epiphytes. The roots of those plants which form the 'ticks and fleas' of the plant world, penetrate the tissues of the 'host,' and derive their nourishment from them. Such roots are called houstoria —and their possessors are known as parasites. This term will be clearly understood.

Stem:

The popular conception of the stem or trunk of a tree is fairly clear, until we come down to the lowly herbs, in which case it may appear very root-like, as in the example of the potato. The stem of a Calladium, which is an under growing stem, like a potato, is called a corm. The onion is an underground stem, and is termed a bulb. The creeping underground stem, covered with scales, such as that of a fern or a canna is called a rhizome. The stem of a palm is known as a caudex. The Euphorbias (often erroneously referred to as Cactuses) and true Cactuses develop thick fleshy (succulent) stems to act as reservoirs to tide them over the dry conditions under which they live. Terms similar to those used to describe the shape of the roots are used to describe the shape of the stems.

Leaves:

The popular conception of the term 'leaf' might be taken as descriptive of the foliage of a plant. A more precise, a more scientific definition of the term includes yet other portions of the plant not usually included under this category. The botanist associates with leaves almost all organs of a plant which appear as lateral out-growths from the stem. The term leaf, then, includes the first seed-leaves, or cotyledons which protect the embryo plant, and provide its 'first meal/ the scales, bracts spates, tendrils, and even flowers! In this view every part of the plant, except the roots and the stem, is either a leaf, or is composed of a leaf or leaves more or less modified or transformed.

Scales:

Scales are usually small, modified leaves forming a protective covering for tender tissue enclosed within them: thus in cold climates many trees cover the extremities of their branches (growing points) with hard scales. The rhizome or underground stem of ferns and the newly uncurling leaves (fronds) are good examples of tender tissue protected by scales.

Stipules:

In tropical climates, where plants are not exposed to marked vicissitudes of season, the trees rarely develop scales. Their place is taken by appendages of the leaves known as stipules. The Banyan, and the figs in general, are good examples of trees having stipules—they will be seen at the tips of the branches protecting the tender shoots. If the stipules fall away soon after the unfurling of the leaf they are referred to as being caducous or deciduous. When the stipules remain in position on the plant for a longer time they are said to be persistent. Stipules are said to be axillary when they arise at the base of the leafstalk within the angle formed by the leaf and the stem—the axil. If the stipule is developed between the base of two opposite leaf-stalks it is described as interpetiolar. Stipules may be transformed into spines or tendrils.

Foliage Leaves:

As there is order in Nature, so we find that the leaves of plants are disposed on the stem and branches in an orderly manner, and not at random, as it might appear. As foliage leaves constitute the 'lungs' of a plant, so to speak, through which the plant 'breathes,' and at the same time the 'synthetic plants' by which the simple substances absorbed from the soil are converted into compounds by the aid of sun-light—the 'fuel'—the leaves must be positioned in such a manner so that all the 'chemical factories' are working to full advantage. One leaf must not overshadow the other entirely as this would interfere with the thorough working of the leaves. Leaves are capable of varying their position according to the source of greatest light. Accordingly, there is a special name given to the subject dealing with the arrangement of the leaves—this study is called Phyllotaxy. The leaves may be placed on either side of the stem, at the same level, when they are spoken of as opposite. If opposite leaves are arranged at right angles to, and above each other, the arrangement is called decussate. When there are more than two leaves together at the same level they are said to be whorled. If the leaves are not at the same level; as in the case of opposite leaves, but arranged at various points along the stem, such leaves are spoken of as being alternate. Some leaves are arranged in a well-defined spiral manner; they are then referred to as being spirally arranged. There are a few other terms in reference to the arrangement of leaves, but these need not be dealt with here.

Leaves may be present, as in the case of most plants, but they are occasionally absent as in the case of some of the parasitic plants, such as the Dodder (Cuscuta), or Broomrapes. They may be also apparently absent, having been transformed into spines, tendrils, and even into storage organs.

A leaf may be divided into regions, the two main being the leafstalk, or petiole, and the leaf-blade, or lamina. One or the other may at times be suppressed. Both vary considerably hi size, shape, texture, and hairiness. Let us commence with the petiole. It may be short or long, stout or slender; it may have wing-like expansions, in which case it is termed winged—this is commonly the case with the leaves of some of the Citrous fruits. The petiole may be flat, round or channelled, etc. We now come to the leaf-blade. The blade varies considerably and as it forms one of the major characteristics for classification, botanists have been forced to adopt a complex terminology to describe adequately the various shapes without having to write unwieldy descriptions (which would be unnecessarily long). The conventional leaf is usually lance-shaped, lanceolate. There is the elliptically-shaped leaf, the egg-shaped or ovate leaf; the reversely egg-shaped, or obovate; the leaf with almost parallel sides, or oblong leaf; the kidney-shaped leaf, reniform; then there is the heart-shaped leaf, cordate; the same shape reversed would be obcordate. The leaf may be shallowly or deeply divided so as to appear lobed, or like the palm of a hand, when it is said to be palmate. Besides, numerous combinations of these terms are used, such as linear-lanceolate, oblanceolate, etc., to describe the variants from the true-shaped. So far we have been dealing with the general shape of the leaf. The base of the leaf is also described in similar terms; if the leaf-blade runs down the leaf-stalk so that it is difficult to distinguish stalk from blade, the margins are said to be decurrent; when the base is narrowed into the petiole, but the petiole is distinct, the base is said to be cuniate or wedge-shaped; the base may be rounded, or heart-shaped, cordate. These are the most common forms.

The tip of the leaf also has its full complement of descriptive terms, thus: it may be sharply pointed, acute: it is termed obtuse when the tip is blunt; it may be notched when it is said to be re-tuse; it may have a small sharp point when it is called mucronate. The tip, or apex, as it is also called, may be lengthened into a long tail as in the case of the Pipal leaf, and is then termed acuminate; if the tail is remarkably long it is referred to as caudate (this term must not be confused with the term cordate). The margin of the leaf is also variously described; if it is wavy, undulate; if the edge is like the teeth of a saw, serrate; if the teeth are somewhat rounded, crenate; if the teeth are about half-way between the last two terms a combination, serrate-crenate, is used. If the teeth are very small, diminutives of these terms are used, serrulate or crenulate. If the margin is plain it is called entire.

There are also words which describe the texture of the leaf: if thick and fleshy, succulent; if thin, membranous; if somewhat stiff and leathery, coriaceous. The condition of the surface of the leaf is also described. If it is smooth and shining, without any hairs, glabrous. The opposite of glabrous is hairy, but the amount of hairiness varies and accordingly the different conditions have been appropriately termed. The hairs may be simple, or they may be branched, or yet again, they may be star-shaped, stellate, or club-shaped, clavate, and so on. If the hairs form a dense felt, the surface is described as tomentose; if stiff and somewhat long, hirsute; if flaccid, cilliate, or silky, according to texture; woolly if dense. When the hairs are downy the condition is known as pubescent. In some plants the surface is covered with a waxy powder or bloom, and is then spoken of as waxy.

Like animals, plants must have canals for the circulation of the 'blood'—in plants this 'blood' is the sap and the channels which convey it are called the veins or nerves. The main nerve dividing the leaf-blade into two halves is called the mid-rib or main-nerve, while the lateral nerves are referred to as such, or as secondary nerves. Like the leaves, the lateral nerves may be opposite or alternate. Instead of a single main-nerve arising from the petiole there may be several, all running equidistant from each other, such venation is said to be parallel. In most plants the veins form a lace-like net-work, and such venation is called reticulate. When several prominent veins arise at the base of the leaf and radiate into the lobes, as in the case of the palmate leaf, the venation is also referred to as palmate. There are a few other forms which need not be dealt with here.

At first sight it might appear quite simple to determine what is a leaf and what is not, but many a time the layman refers to a small segment, or leaflet of a leaf as a leaf! The botanist divides leaves into several categories according to their structure, but the two main divisions are: the simple leaf, such as the leaf of the Banyan tree, and the compound leaf, such as the leaf of the Gul Mohur which is divided into small leaf-like expansions, the leaflet^. A compound leaf may be figuratively described as the work of an 'idler' with a pair of scissors; Suppose a large leaf were so cut up as to leave the main nerve with leaf-like expansions on either side of it in a featherlike pattern, then we have the first form of the compound leaf, the mid-rib is now referred to as the rhachis, and the leaflets on either side with the lateral nerves as their main nerves, as the pinnae. The 'idler' not content with this design goes yet further, he cuts up the large leaflets into small shapes, leaving the main, nerves as the 'rhachis' of the new leaflets; he has now produced a twice pinnate bipinnate, leaf. If the procedure of cutting yet smaller leaflets were continued we would get the tripinnate, quadripinnate, and so on, till we finally come to the most complex form of leaf which is described as de-compound leaf. The leaflets may be either oppositely or alternately disposed along the rhachis. If there is an odd leaflet at the end (top) of the rhachis, such a leaf is termed imparipinnate, which simply means oddly pinnate, but if there is no odd leaflet, the leaf is abruptly pinnate or paripinnate. The same terms which describe the shape of the leaves are used for the description of the leaflets.

If we again suppose the 'idler' at work, this time using the palmate leaf for his ground plan, we get a different type of compound leaf, trifoliate, quadrifoliate, etc., or even the digitate leaf. At first he takes a leaf with three main nerves arising from the base, and cuts a leaf shape round each nerve, he has produced a leaf with three leaflets, trifoliate; if he did the same with a leaf which has five or more prominent main nerves, he would arrive at the form of five or more leaflets, and so on. The leaf of the Flame of the Forest or any of the Erythrinas serves as an example of the trifoliate type, while that of the Silk Cotton with more, 7-to 9-foliate. Usually the figure representing the number of leaflets and the term, foliate, immediately after, expresses the type.

The petiole, pinnae, and the leaflets of many compound leaves are provided with an enlarged cushion like base, termed the pulvinus. The pulvinus is a mechanism which enables many plants to change the direction of, and move the position of their leaves according to the amount of light, or other stimulus. The same mechanism is largely responsible for the attitude of 'sleep' adopted by many plants during the hours of darkness, or in storms— the Rain Tree is a good example. The reaction of the familiar 'Touch-me-not', or sensitive plant, to the touch of the hand, or other stimulus is well-know—again, it is the pulvinus which enables the plant to fold its leaves so rapidly,

Flower or Floral Leaves:

Flowers are the 'trade marks' and the 'advertisements' of the plant world- Flowers are generally conspicuous, but there are a large number that are minute and require the aid of a powerful magnifying glass to reveal their structure and beauty. Again the botanist and the layman are at 'logger heads!' The layman calls the Arum Lily a flower, the botanist says it is not, it is an inflorescence! An inflorescence is a collection of flowers. Of course, the botanist is right, for, to a botanist a flower is that portion of the plant which is capable of producing either the male or the female elements, or both, whether it be surrounded by colourful structures or not. Thus, to return to the Arum Lily, the surrounding white, leaf-like portion is the spathe—merely a leaf which acts as a protection to the candle-like structure, or spadix, on which the flowers are developed. The so-called Cobra Lily of India is yet another example of this type of inflorescence. Accordingly, it is sufficient for the plant to produce either an ovule or pollen to be able to call it a flower, this is exemplified by the Duckweed (Wolffia) which represents the smallest flowering plant in the world—no larger than a pin-head.

The conventional flower is constructed on the 'plan of five'; a plan so often met with in the animal world as well—take your hand for example! But the plan is much mutilated by suppression, multiplication, or transformation of the various appendages

The flower is usually mounted on a flower-stalk, the pedicel. To be a pedicel it must bear but a single flower, but when there are more on the stalk it is called a peduncle, (however, the two terms are occasionally rather loosely used). The pedicel, or the peduncle, may be present or absent, or it may assume various shapes, as we have observed in the case of the Cashew, for example. At the base of the pedicel there may be present a small leaf-like structure, the bract, while at the top of the stalk, just under the flower, there may be one or more similar organs, the bractioles. Now we come to the flower 'proper'. The first or the lowest set of structures are the five sepals, which, when spoken of collectively, are known as the calyx. The sepals may be separate or they may be united along their margins to varying degrees. If the sepals are united to form a cup-shaped structure, the calyx is said to be campanidate. The same terms which describe the shape, texture, etc., of the leaves apply in the case of the sepals. The calyx forms the outer protecting covering for the delicate petals within. In some cases the sepals themselves appear like petals and are then described as petaloid. If the petals should appear like the sepals the term sepaloid is applied. There are some flowers in which the resemblance is so close that it is difficult for the novice to tell one set from the other, but the position will help to separate the two 'whorls.' The petals are usually alternate with the sepals in position, and usually form the most colourful portion of the flower—the 'advertisements,' the value of which we shall learn later. The petals taken together form the corolla. The calyx and the corolla considered as a whole form the perianth. Within the ring of petals and usually alternate with them are five filaments or another stalks, which support at their extremities, the anthers (pollen carriers). The anthers contain the pollen, or male element in the form of fine granules or dust. The filaments and anthers taken together are called the stamens. The position of the stamens varies considerably, and their position and formation form a good means of classification when taken in combination with other characters. In the centre of these coronets of floral leaves is the ovary or female portion of the plant which in time, after fertilization becomes the fruit. The fruit contains the seed, or seeds. On the top of the ovary there is the stigma, the organ which receives the pollen. -The stigma may be set directly on the top of the ovary, or it may be stalked. The stigma and stalk together are spoken of as the style. The stigma may or may not be divided into two or more segments. It may be club-shaped, clavate; umbrella-like, umbonate funnel-shaped (here is a mouthful!) infundibuliform; or it may end in just a blunt point, or be divided into numerous segments as in Dillenia. The ovary, style and stigma taken together are termed the pistil. Within the ovary is the female element, the ovule. The ovary may be positioned below the perianth, in which case it is called inferior, but when it is above the perianth it is referred to as superior. In some instances the ovary is raised far above the perianth, on a stalk called the gynophore. Such a structure is seen among the Capers.

A flower with its various parts arranged in groups of fives is described as pentamerous; if in threes, trimerous; in fours, quadrimerous, and so on. However, there may be in the same flower a quadnmerous calyx and a pentamerous corolla, or vice versa. The most common form assumed by flowers is the star-shape, stellate; when cup-shaped it is termed campanulate; funnel-shaped, infundibuliform; (the old tongue twister!) as in flowers of some of the Convolvulus. In the case of the pea family the corolla is 'divided' into two distinct regions, a large showy petal turned upwards, the standard or banner-petal (vexillary), and a boat shaped structure at its base, the keel, formed of the remaining petals and enclosing the stamens and the style. The flower of the snap-dragon is described as two-lipped. Then there is the tubular flower of the Honey-suckle. There is an infinite variety of form assumed by the flowers of plants and the reader will find a host of them in a morning's walk. The shape and structure of the various parts are described by the same, or similar, terms as those used for describing foliage leaves. In Orchids and some of the lower families of plants, though the perianth lobes (sepals and petals) are fairly distinct, the stamens and pistil have been transformed into a most complicated structure the description of which would be too confusing to the layman. Suffice it to say that in the Orchids the pollen has been collected into club-shaped masses, the pollinia. The pollinia are mounted on stalks with an adhesive base to enable them to stick to the body of insect visitors, and thus be conveyed to another flower to effect cross-fertilization. The subject of fertilization will be dealt with below-

If a flower, or a tree, is of one sex, either male or female, it is called monoecious; if both sexes are present together, then dioecious.

Fruit:

The ovary, which we mentioned above, is the receptacle for the ovule. After fertilization the ovule develops into the embryo, or young plant, neatly folded in the seed. The whole structure is called a fruit when it reaches maturity. The popular and botanical definitions of a fruit are often at variance. We have already observed, in the case of the Cashew that the enlarged pedicel is popularly referred to as the fruit, and the seed, as the nut! Botanically, the nut is the fruit. The edible fig is yet another example of a confusion of ideas in the strict sense. Botanically, the edible portion is the receptacle or 'plate' on which the minute flowers within are set, and these finally develop into minute granular seeds. A fig may be likened to a sunflower—a sunflower is not a single flower, but an accumulation of small flowers or florets growing on a flat plate-like structure, the thallus. Now if we suppose the margin of the thallus gathered in by a cord, like the mouth of a bag, we have produced the receptacle of the fig! A small hole is left for the fertilizing insects to come and go. Thus strictly speaking, a fig is not a fruit! Then again there is the case of the tomato. This luscious fruit is called by the layman a vegetable! From the layman's point of view, the manner, or way, in which a fruit is eaten, determines whether it is a fruit or a vegetable—he is not concerned with its shape or origin, but its taste and goodness! What then is a fruit? Botanically a fruit is that part of the plant which is capable of producing a new plant* (ultimately the seed)—i.e., whether it is a grain of rice which is enclosed only in a husk, or whether it be a water-melon with its seeds embedded in pulp, and a large 'casing'.

To be in keeping with the 'plan of five,' if we take a conventional fruit, we will find that it is built on the same plan as the other floral parts. The ovary is composed of five carpels which generally reveal themselves in the mature fruit, when it opens, or technically, dehisces. The carpels separate to free the imprisoned seeds. Some fruits do not open and are then described as indehiscent. As in the case of the sepals and petals, the various parts of the fruit may be .modified and the modifications are expressed by special terms.

All fruits do not open in the same way: there are some that do not open at all, but have to be burst by extraneous pressure, or by the gases of decomposition. The various forms of dehiscence are known by different names. If the fruit opens along the sutures of the carpels, this form of dehiscence is called valvular dehiscence: if the fruit splits transversely, this form is called circumscissiles if dehiscence is effected by small holes, or pores, at the top of the fruit, this form is referred to as porous dehiscence. There are many forms of dehiscence and the fruits are classified according to the manner in which they dehisce.

Indehiseent single carpel fruits: The fruit of the Clematis is called an achene. A grain, such as rice or wheat, is called a caryop-sis. The fruit of the Mango is called a drupe; likewise the Apricot, the Plum, the Cherry and even the coconut are included under this category.

Indehiseent two or more carpel fruit: The seed of the sunflower is known as a cypsela, but in many of the floristic works this form of seed is referred to as an achene. The Cashew-nut (excluding the succulent pedicel) is called a glans or nut. The acorn of the oak is called a capsule. There are a number of fruits which, though they split away from the main axis into several pieces according to the number of separate carpels, do not liberate the seeds; such fruits are called schizocarps. To this form of fruit belong the fruit of the Castor-oil plant, which in its turn, is known asaregma. The flat winged fruits of the Ind'an Elm, Ash, and Maple are called samaras.

The fruit of the Gooseberry and the Currant are termed bacca or berry. The large fruit of the Baobab is called an amphisaca: The fruit of the Calabash is also included under the same name. The various forms of pumpkins, cucumbers, and their like, are termed pepo. Citrous fruits, such as Oranges, Lemons, etc., are known as hesperidium. A walnut is called a tryma and finally the Pomegranate is called a balausta.

Dehiscent single carpel fruits: The fruit of the Champa is called a follicle, likewise the fruit of the various Serculias—in these cases the individual carpels appear as separate fruits. The well-known Peas and Beans are termed legumes or pods. The legume assumes different shapes and splits differently—the 'string-of-beads like' formation of the Babul is called a lomentum, and so on, but the variations are beyond the scope of this brief sketch.

Dehiscent many carpel fruit: The fruit of the Silk Cotton tree is a good example of one form of capsule. The fruit of the Poppy is another form of capsule with a porous dehiscence. The fruit of Helicteris is another example of the capsule, the spired capsule. The fruit of the Mustard or the Cabbage resembles a legume very closely; but must not be confused with that form of fruit—the valves or carples separate from the central axis—this form of a fruit is called a siliqua. The fruit of Pines and Firs are called cones.

False fruits; Examples of false fruits are Raspberry and Strawberry; such a fruit is called an ectaerio. The fruits of the Apple and the Pear are known as pomes.

Anthocarpous or aggregate fruits: This form of fruit may be described as the result of an inflorescence and not of a single flower. The fruits of the Mulberry, the Pineapple and the Jack-fruit are all examples of what is called a sorosis. The fruit of the fig is styled a syconus.

Seed:

The seed is that portion of the plant which is capable of giving rise to a new individual when given the necessary amount of moisture and heat. The seed coat is often variously and beautifully sculptured and accordingly the different patterns have received appropriate terms.

POLLINATION AND FERTILIZATION

Pollination is the transfer of the pollen from the anther to the stigma. Fertilization is the union of the sexual elements. As most plants are incapable of movement or progression, Nature must find a way to ensure the union of the sexes and secure the continuance of the species. This union she achieves in several different ways by calling to her aid the elements, wind and water, and by harnessing some of her creatures. We shall now consider the various agents in order, and see how they do their work, but as the subject is a vast one we can only touch the fringes and give an example or two from each:—

(a) Wind Pollination: In order that the pollen may be transported by the wind, it must be light, be able to resist desiccation to a degree, and the anthers must be so situated that the pollen is easily blown away by the wind. Another essential of wind-borne pollen is that it must be produced in great abundance so as to lessen the chances of failure. Grasses and sedges are good examples of this form of pollination. The familiar complaint, hay-fever, which is so prevalent at certain seasons of the year, is caused by the abundance of pollen dust in suspension in the air—the pollen when it reaches the mucous membranes sets up an inflammation often resulting in fever.

(b) Water Pollination: Water usually acts indirectly as a pollinating agent. The pollen itself is seldom transported in the medium. In many water plants flowing water assists in bringing the sexes together and pollination takes place by contact. (Wind also assists some aquatic plants in the same way). One of the most outstanding examples of this form of waterborne pollen is illustrated by Vallisneria, a submerged aquatic plant largely used by aquarium keepers. In this instance the male flowers are developed at the base of the plant; when they are mature they break away from the parent plant and float at the surface where they drift about till finally they contact the female flowers. The female flowers are borne on long spirally twisted stalks which vary in length in accordance with the depth of the water. As the flower matures the stalks gradually unwinds and the female flowers breaks the surface, where it contacts the drifting male. After fertilization the 'spring' recoils drawing the flower once more below the surface to mature into fruit in comparative safety.

(c) Animal Pollination: In the animal world is to be found the greatest number of pollen distributing agents, especially among the legions of insects. Pollen intended for distribution by animal agents is usually provided with hooks, barbs, or some other form of entanglement so that it may be caught up in the hairs or scales, or the pollen is viscid and is consequently able to stick to the body of the agent. Animals are out and out 'materialists' and will not visit a flower for its beauty! The flower must provide or 'pretend' to provide, something attractive to the visitor. This attraction usually takes the form of food, or the scent of food, or it may form the food for the young. The devices are legion and would take a whole volume or more to describe. At the base of the petals, or near by, there are glands in many flowers which secrete a sweet juice or nectar, which is much sought after by the visitors. These glands, or others, may emit a strong odour which is reminiscent of food. The odour may be sweet scented or foul to our nostrils, but the visitors know which suits them best!

The construction of flowers is such that they cannot be indiscriminately visited by any and every insect. This specialization of the flowers to the visitors, or certain groups of insects only, is perhaps mainly responsible for their great diversity in form. The flower may be adapted to a single species of visitor, or to a certain group of visitors only. As a rule the visitor contacts the stigma as it enters the flower and on leaving it carries away pollen by contact with the anthers in its efforts to secure the nectar. The freshly collected pollen is thus brought in contact with another stigma when the animal visits another flower. In this manner cross-fertilization is effected. In many flowers self-fertilization is provided for in the event of cross-fertilization failing.

Let us now turn to a few, a very few, examples of specialized flowers—the Snap-dragon for one. The mouth of the corolla of the Snap-dragon is firmly closed and the stigma and anthers are hidden from view. In this case the weight and strength of the visitor must be such that the flower will open as it alights, or as it forces its head into the opening. The anthers and stigma are in such a position that the visitor must contact them as it enters. In the case of the Snap-dragon the Humble Bee is one of the visitors. Another curious instance is the flower of Aristolochia (several species are to be found in gardens). The corolla is long and tubular. It emits a strong odour which attracts carrion flies. The flies settle on the flower and, attracted by the odour, wend their way down the throat of the corolla through a dense forest of long, stiff, downwardly directed hairs. Once inside there is no retreat till such time as the anthers ripen and explode, covering the trapped visitors with a coating of pollen dust. Soon after the anthers explode the hairs barring the exit break down and the prisoners are permitted to leave at will. Away they go to another flower to be treated in the same way, and thus the flies serve the plant, only to be rewarded for their pains with a little nectar, or nothing at all. Flowers that are visited by carrion or fruit flies, not only emit the odour, but often resemble the real thing hi colouring. Bees and flies are not only insects that act as pollinating agents, but many other insects do likewise.

Birds play an important part in pollination too, but such flowers are usually also accessible to other visitors as the stigma and anthers are freely exposed. The plumage, especially in the neighbourhood of the head and throat, gets covered with pollen dust, so much so, that the regions may appear quite yellow. Many of the small arboreal mammals serve plants in the same way and help in the distribution of pollen. Some flowers are fertilized by bats. The time of the opening of the flowers varies much in accordance with the period of activity of the visitors, but how the time has been synchronized remains a mystery. The colour, also, probably varies much in response to the 'taste' of the visitors. It is well known that the visitors are attracted by a certain colour or group of colours only, and not by others, but this is all too vast a subject to be tackled here, and was only introduced to show the enormous amount of interest that arises out of the study of plant life.

SEED DISPERSAL

If all the seeds produced by a tree during its lifetime were to fall straight down and were to germinate where they fell, the large number of seedlings would soon crush themselves out of existence and perhaps the parent too. Accordingly, Nature must find some means of scattering the seeds sufficiently far from the parent plant to enable them to develop to their fullest extent. We have already seen how Nature utilized the elements and some of her creatures to assist in the distribution of pollen. For the purpose of seed dispersal she has again requisitioned the services of the same agents. Let us again examine them under their respective heads:—

(a) Wind dispersal: In order that the seeds may be scattered far and wide by the wind it is essential that, like pollen dust, they should be light. The seeds of orchids are good examples. These seeds are so small that it requires a good lens to examine them. A way hi which heavier seeds may be dispersed, is by the seed, or the entire fruit, producing some form of wings or parachutes to enable it to be transported through the air. Wings and parachutes vary very much in their texture and shape. The seed of Pterospermum has a wing on one side only. In Oroxylon the seed is entirely surrounded by a thin papery membrane, which enables it to drift through the air for a considerable distance. Many members of the sun-flower family, the Dandelion for example, develop a silken, umbrella-like parachute—such a seed may rise very high and travel long distances before it comes to rest. Another form of parachute is seen on the seeds of Plumeria and Calotropis, In these instances the parachute consists of a tuft of silken hairs at the end of the seed which enable it to drift through the air, but generally in these cases the duration of the parachute is much shorter than the form met with in the sun-flower group. Another form of parachute is that of the Silk Cotton tree. The seeds are embedded in a considerable amount of silk. When in flight the seeds lie free in the meshes of the silk on the bursting of the pod, the seeds, cradled in the silk, are blown about till they drop out of the meshes. There are many other forms, and those interested wilt find numerous examples in the field.

Winged fruits also display a great variety of form. The fruit of the Sal has a 4-5 bladed propeller attached to it. The propeller prevents the seeds from going too rapidly to earth so that it is caught up by the wind currents and wafted away from the parent plant. The carpel of the fruit of Erythropsis acts as a form of sail. In the case of the Padauk and the Indian Elm, the entire fruit appears like a winged seed, like the seeds of Oroxylum.

(b) Water dispersal: Water does not merely transport seeds but very often it transports whole plants, especially when rivers are in flood. Water-borne seeds or fruits must be impervious to water, for a time at least, and must be able to float. A most striking example of this form of dispersal is the fruit of the Indian Lotus (Nelumbo). The fruit is borne on a long stalk far above the surface of the water: it is shaped like the cup of a chalice with a number of sockets to hold the seeds. Internally the chalice-like structure is composed of spongy tissue which enables the fruit to float. When the fruit is mature

it falls away and floats on the surface of the water, the seeds being uppermost—it is a readymade 'boat!' In this 'boat' the seeds are cradled for a considerable time, and may even germinate in situ. In time the 'boat' after a checkered career on the surface of the water, decomposes, and the seeds, or seedlings, sink to the bottom far from the parent plant. The Water-lily, Nymphia, has another means of dispersal, In this case the fruit matures at the surface of the water and on maturity burst; each seed is provided with a translucent 'aril' which acts as a float. When the seeds first leave the parent, they float near the surface, but the float is short lived. It soon decomposes and the seeds go to the bottom.

(c) Animal dispersal: The most varied form of dispersal is to be found among fruits intended for animal dispersal. Animals may act as dispersal agents in two ways mainly: Firstly, by transporting indigestible seeds eaten along with fruit; and, secondly, by carrying away seeds adhering to their bodies'. In the first instance, the seeds from fruit eaten are provided with a tough coating sufficient to resist the digestive juices. Such seeds are eventually passed by the animal in its faces far from the place where the fruit was eaten. In the second case the seeds or fruits attach themselves to passing animals by means of specially developed hooks, barbs, or glandular, sticky surfaces. The seeds become entangled in the fur or feathers and in this way are carried far from the point where they were collected. Those who have been for a walk in the country know full well the burrs, spear-grass, etc., that have to be picked off their clothing on the return home! They have unwittingly fulfilled Nature's design! Animals often suffer much from the attachment of thorny fruits to their coats.

Another way in which animals often transport seeds externally is in clots of earth which may become adherent to their bodies and feet, specially when they go into water, or wallow. Seeds buried in such mud are carried away; when the mud dries it flakes off, sometimes miles away from its point of origin, and in this way the seeds are carried away from the parent. Aquatic birds have been known to carry seeds adhering to their plumage, or in small clots of earth sticking to the bill or feet. Thus seeds are often transported hundreds, and perhaps thousands, of miles from 'home'.

Some plants after fruiting dry and remain standing for a considerable time. In such plants the fruit, a form of open capsule, is developed at, or near, the extremity of the stem, and the stem does not easily break. Passing animals brush against such stems bending them down as they do so: on being released the stems spring back to their original position, at the same time hurling the seeds out of the capsule. This is yet another form of animal dispersal, and the common Mexican Poppy is a good example.

Man must be included among the animal agents. He is probably one of the greatest dispersal agents of many plants which would never have reached a new continent without his aid. Man transports large numbers of plants, either wilfully, for the sake of their beauty, or for their food value, or he may do so unintentionally along with other seeds or merchandise. In this way he has transported a large number of plants to his sorrow, and the destruction of-the native vegetation: the Water-Hyacinth and the Lantana are good examples, not to mention the Cactus.

(d) Mechanical dispersal: By mechanical dispersal is meant that the fruit itself has developed a means of dispersing its seeds without the interference of any outside agent. This form of fruit is usually of the explosive type. A good example of it is that of the common garden Balsam. When the fruit of the Balsam matures, it suddenly explodes ejecting the seeds to some distance. This same result is brought about by touching ripe, or nearly ripe, fruit, and children who have discovered it delight in exploding as many of the fruits as they can. The seeds of many plants are hurled with considerable force, and a small report, as the capsules burst. A good example of this is seen, and felt, if the observer stands near a Euphorbia (often erroneously called a Cactus in India) when the fruit are ripe. There are a series of small reports as the capsules burst, and if the observer is in the 'line of fire' he will be hit by the seeds.

All these are but a few of the large number of devices employed by plants to disperse their seeds—just a taste to show how fascinating the subject of botany is when studied in the field.

FORESTS

Forests are variously classified by botanists according to the different species of plants composing the forest, which hi turn are dependent on their geographical position and climate for their well being. It is very difficult to classify a forest correctly. Firstly, it requires a sound botanical knowledge, and secondly, there is so much intergrading between the extreme types that it is almost impossible to draw hard and fast rules, even when given the first condition. For the layman it will suffice to say that there are two main divisions, namely:—

(a) Evergreen forest: Such forests are composed of trees which do not shed their leaves all at once, so that only bare trunks and branches are left. Evergreen trees shed their leaves slowly, at the same time producing new ones—there is no marked change in the condition of the foliage of such trees. Under this heading are also classed the evergreens of the temperate forests—some botanists are at variance on this point, but we shall leave them to settle their disputes. In India the evergreen forests are more or less restricted to the areas of high rainfall. The dense forests of Kanara, South India, Assam and Burma, for example, all fall into this category. Such forests are termed tropical rain forests.

(b) Deciduous forests: Forests of this type are, broadly speaking, composed mainly of trees which for a period in the year, usually the cold and dry seasons, are devoid of leaves, and are consequently almost shade less, but this nudity is amply compensated by the production of flowers, soon to be followed by the delightful shades of the tender leaves ranging through almost every shade of green, purple, copper, and red. Gradually, very gradually, these hues give place to the brightly coloured new leaves, and once more the nakedness of the trunks is hidden from view. During the monsoon period the floor of the forest is carpeted with all manner of vegetation, and the trees are festooned with creepers. Under such conditions, deciduous forests are difficult to distinguish from evergreen forest, unless, one is familiar with the various species constituting the forest. This type of forest is also called monsoon forest.

Apart from these two main types there is scrub jungle in areas of little rainfall, composed of scattered, usually thorny trees and thorny bushes. There are various forms of grasslands, and finally we come to the arid desert regions, hot or cold, where there is either no vegetation at all, or only such plants which have specialized themselves to enable life in such deserts possible. It is my aim to write a popular book, to give the reader a very superficial picture of the plant world, not to write a textbook, so I cannot delve too deeply into the mysteries awaiting the student.

The forests of a country form one of the major national assets; so much is dependent on their existence, careful preservation, and judicious utilization, that careless and indiscriminate deforestation may change the surface of the land, and finally alter the life and condition of the people, usually to their cost and detriment Of recent years we have heard much about the preservation of game in India, but has a word been raised for the protection of the forests? That is another matter! With regard to deforestation I quote the words of no less a light than the Right Hon. Lord Avebury:—

“The reckless and wanton destruction of forests has ruined some of the richest countries on earth. Syria and Asia Minor, Palestine and the north of Africa were once far more populous than they are at present. They were once lands ‘flowing with milk and honey,’ but are now in many places reduced to dust and ashes. Why is there this melancholy change? Why have deserts replaced cities? It is mainly owing to the ruthless destruction of the trees, which has involved that of nations. Even nearer home a similar process may be witnessed. Two French departments—the Hautes and Basses Alpes—are being gradually reduced to ruin by the destruction of the forests. Cultivation is diminishing, vineyards are being washed away, the towns are threatened, the population is dwindling, and unless something is done the country will be reduced to a desert; until, when it has been released from the destructive presence of man, Nature reproduces a cover of vegetable soil, restores the vegetation, creates the forests anew, and once again fits these regions of the habitation of man.”

The lessons of deforestation cannot be too strongly brought home, and on this account my reader will pardon the introduction of another quotation, this time from the work of an archaeologist and anthropologist. Here it is:—

“The most fatal and incalculable factor of the seasons is the rainfall. Since reckless felling had destroyed the last remnants of primeval forests which, by the evidence of the stone age deposits, once covered the land, the treeless loess plain has become exceptionally sensitive to changes in rainfall. If the normally light rainfall fails, there is no reserve of moisture in the plateau, which is drained in innumerable ravines. If on the other hand the summer rains come with the violence of a cloudburst, as not infrequently happens, the ravines are widened with catastrophic rapidity. New miniature ravines are formed in a single night of rain, houses are threatened, and roads are diverted. Most feared is the drought, which is synonymous with starvation.”

Lord Avebury speaks of the return of the land to Nature and she will heal the sore, but WHEN? This all takes many hundreds, or perhaps, thousands of years. His Lordship could not have visualised the rapid destruction in progress TO-DAY owing to the needs of a modern war! IT IS FAR BETTER TO AVOID THE SORE THAN TO LEAVE NATURE TO CURE IT. Before concluding this section on Forests let us have a look at the results of deforestation.

It is well known that forests 'entice' rain. When the rain falls the millions of tons of water are held within the tissues of the trees and in the soil protected from the heat of the sun. The millions of roots in turn hold the soil in place. It is the forests which protect the soil from being washed away; it is the trees which, by the shedding of their leaves and dead branches, enrich the soil—they lay down a layer of humus; it is the trees which feed and protect the animal life within the forests, either directly or indirectly. In this way Nature usually keeps the balance admirably till Man enters with an AXE, and begins his work of destruction, either out of pure ignorance of the true balance of life, and the necessity for the vegetation, or, purely for personal gain, regardless of the country and of posterity. What are the results of reckless deforestation?

(a) Reduction of rainfall

(b) Erosion of soil: what rainfalls can no longer be contained in the soil: it flows on the surface carrying away large quantities of earth; in hill tracts there are landslides: finally only the bare rocks are left, or an infertile soil.

(c) Floods in many areas frequently result from deforestation.

(d) BARRENNESS is the grand finale.

All these processes are generally so slow that the average man pays little or no attention to them and only wakes up to the situation when it is impossible to retrieve it (if he wakes at all!). In many parts of India these wasteful processes have been and still are at work—it is a black picture. Let us pause and face the facts squarely, whether it is private or government owned forest ruthless deforestation WILL AFFECT THE COUNTRY AS A WHOLE. Do not let us follow, in this matter the line of the immortal Omar:

INTERESTING POINTS ABOUT TREES

The Age of the Trees: The human span of life, even the mythical age of Methuselah, pales before the almost astronomical age for some of the vegetable giants. The longevity of the individual varies much according to the species. The layman may rightly wonder how the age of the tree is estimated. The tree usually keeps its own record by the development of a series of growth rings, technically, annular rings, hi the stem which, when properly counted by the initiated, give a fairly accurate idea of the age of the individual. Unfortunately, to be able to count the rings the tree must be felled and a careful cross section made of the stem. Scientists, however, make a systematic study of the annular rings and correlate them with the annular increase in girth of the trunk, and in this way they are able to save the giants from the axe to find the correct age. A small margin of error, of course, creeps in with this method, which must be allowed for. From the appearance and number of the rings the botanist is not only able to tell the age of the plant, but he can get a good idea of the vicissitudes of climate the plant has experienced during its life—it is a climatologically record as well.

The oldest known plants are by no means the largest, for it is among the Tern Palms' or Cycads we find the Methuselahs of the Vegetable Kingdom. The Cycads are the surviving remnants of the Coal Measures, a time when they were more numerous—they are 'living fossils.'

Professor Charles J. Chamberlain of Chicago University made a special study of the Cycads of the world, and according to his estimation a species of Macrozamia, a genus confined to Australia, attains an age varying between 12,000 to 15,000 years! The next in order of age is the Baobab 5,150 years, an African tree often cultivated in India. The American Sequoia comes next, 4,000 to 5,000 years. Below is a list of some of the longest lived trees:

Pipal, *Ficus religiosa*	2-3,000	years
Pyramidal Cypress, *Cupressus sempervirens*	2-3,000	,,
New Tree, *Taxus baccata*	900-3,000	,,
Juniper, *Juniperus communis*	2,000	,,
Swamp Cypress, *Taxodium mexicana*	2,000	,,
Cedar of Lebanon, *Cedrus libani*	1,200-1,300	,,
Norway Spruce, *Picea Excelsa*	200-1,200	,,
Oak Quercus sp.	500-1,000	,,

There are a few others which reach 1,000 years or nearly so.

Giant Trees:

The height, girth and age of a tree are by no means in constant relation to one another, consequently when estimating the age, due allowance must be made for a margin of error. Which then, are the worlds, tallest trees? The prize for tallness goes to the Australian Peppermint Tree, a species of Eucalyptus (E. amygdalina) which attains a height of 450 to 480 ft. (140-150 m.) A close second to this tree is the Californian Mammoth Tree (Sequoia gigantea) with a height of 250 to 450 ft. (79-142 m.).

The Peppermint and Mammoth trees are veritable giants when we consider vertical length, but even this is soon eclipsed by the length of some of the world's largest creepers (lianas). Among the seaweeds there is a giant which exceeds the height of the tallest trees at least two or three times over in its length. This seaweed is known as Macrocystis and has been known to reach a length of 1,500 ft.! Canes (Calamus sp.) have been known to exceed 700 ft. in length.

The 'palm' for the greatest girth goes to the Chestnut Tree (Costarica vulgaris). The tree attains the maximum girth of 65 ft. (20 m.). The Mexican Cedar (Taxodium mecicanum) comes next in order with a girth of approximately 52 ft. (16.5 m). The circumference of other trees pales in the face of these dimensions; perhaps the Baobab only could vie with the Cedar!

The greatest crown of foliage is developed by the Banyan Tre^ (Ficus hengalensis) of India. The most famous of these tress is an "historical monument' and is known as the Nerbadda Banyan. This tree was referred to by Forbes in his Oriental Memoirs as far back as 1834. Of this tree he writes the following: —

"There are none of this magnitude at Bombay; but on the banks of the Narbadda, I have spent many delightful days with large parties, on rural excursions, under a tree supposed by some persons to be that described by Nearchus, and certainly not at all inferior to it. High floods have at various times swept away a considerable part of this extraordinary tree; but what still remains is near two thousand feet in circumference, measured round the principal stems; the over-hanging branches, not yet struck down, cover a much larger space; and under it grows a number of custard-apple and other fruit trees. The large trunks of this single tree amount to three hundred and fifty, and the smaller ones exceed three thousand; each of these is constantly sending forth branches and hanging roots, to form other trunks, and become the parents of a future progeny."

Another famous Banyan is the one in the Royal Botanic Garden, Sibpur, Calcutta, but it is barely half the size of the one mentioned arwve. It has a circumference of 900 ft. The Banyan may be regarded as "immortal" for every branch of a tree may send down roots which in time will assume the character of a trunk, sever its connection with the parent tree, and lead an independent existence, but strictly speaking it is no longer the same tree.

The Largest Flower:

The largest flower in the world grows in Malaya. The plant is a root parasite on vines and only produces a flower; hence perhaps it can afford to be so extravagant as to produce a flower three feet across and weighing 15 lb.! It is known as Rafflesia Arnold!. To go from the sublime to the ridiculous the smallest flower in the world is that of Wolffia, a minute Duckweed, in which the whole plant does not exceed 1 to 1.5 millimetres!

Flowering and fruiting seasons:

Most plants have a definite flowering and fruiting period each year, or at longer intervals. The seasons may vary from district to district, and even from year to year in response to the vagaries of the climatic conditions prevalent each year. Then again, young and old trees, like young and old people, are frequently irresponsible for their actions, and irregular hi their habits! Thus young and old trees may at times flower and fruit outside the general flowering period of the species. There are a number of plants with a flowering cycle of several or, of many years, and when the flowers do finally appear it is the end of the life-cycle of the particular species—life has to begin again from seed. Good examples of such plants are to be found among the Palms, the Bamboos, and Strobilanthes.

HOW TO PRESERVE PLANTS

To those who are anxious to make a collection of pressed plants, I trust the simple instructions given below will be helpful. There are many ways of killing a cat, and after a little experience each collector must adapt himself or herself to the method best suited to him or her. The chief requirements are: (a) a sufficient quantity of fairly absorbent paper, (I use old news sheets folded in half—the Times of India for example); (b) labels cut to a convenient size; (c) gum; (d) thread and needle; (e) lastly, but by no means the least, patience! I have not mentioned a press which is usually composed of two boards or grids of the required size. Each one must suit himself in this matter. Now to the job:

1. Collecting: The collector must either take a press into the field, and press the specimens soon after collection, or bring them home in a suitable collecting bag or tin or vasculum—a handy case especially made for botanical collectors. When collecting pick the best specimen available, preferably with flowers and fruit.

2. Pressing: Having carefully selected a suitable twig, lay it out carefully in a folded sheet and close it down, as though it had been placed between the leaves of a book. Put two or three empty sheets between each sheet containing a specimen so as to form a flatter and more absorbent bed. When all the specimens have been pressed in this way, put the bundle between convenient boards, and put it away in a corner with a heavy weight on top, or strap the boards tightly together. The use of a weight is preferable as it presses down constantly as the specimens flatten in course of drying. The strap would have to be tightened periodically. After a couple of days or more, according to the weather and the fleshiness of the specimens, the papers must be changed and again put back under the weight for a further period of pressing. The process of changing the paper must be repeated till the specimens are dry to get the best results. The first changing of paper gives the worker an opportunity of rearranging the specimens to best advantage and of straightening out unnecessary folds which may have come about in the first pressing. The drying process may be hastened by putting the bundle; after the specimens are pressed, either into the sun, or into an oven (the oven must not be too hot else the specimens become too brittle or curl badly).

Leaves too large for the final sheets must be pressed in sections or a drawing made and measurements noted to go along with the specimen. Large fruits must be sectioned before pressing, or dried and kept separately.

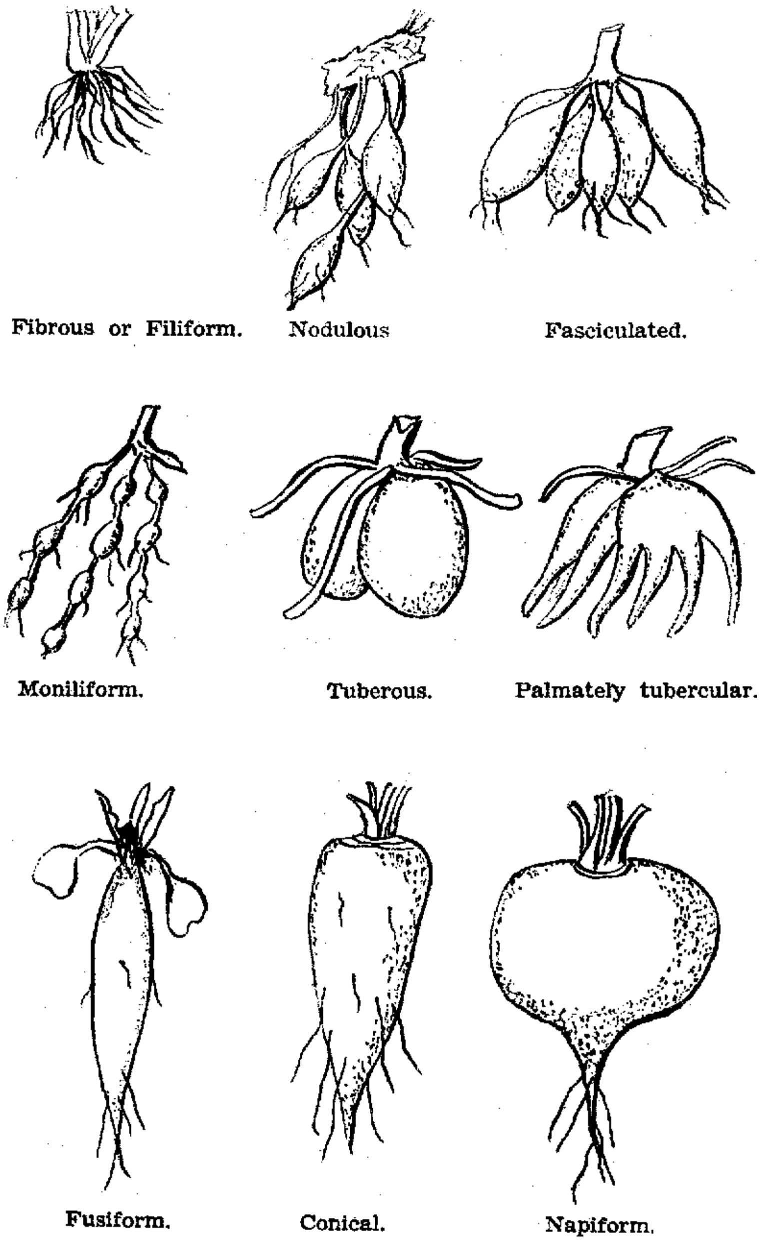
For the serious student I would suggest either painting or dipping the selected specimen for a minute or so in a saturated alcoholic solution (spirits of wine will do) of corrosive sublimate before pressing. This kills the tissues rapidly and prevents disjointing of leaves, stalks, etc. Each specimen should then be clearly marked POISONED. Corrosive sublimate is a dangerous poison and on no account should this method be left in the hands of children or novices. I recommend it only for the serious collector.

3. Labelling: A label less specimen is WORTHLESS. Every specimen must be labelled at the time of pressing—a rough label being used giving the locality, date, colour of flower, or any other character which may strike the collector at the time. A final label can be written out before the plant is put away in the collection. This must give the name, and the details which were noted on the rough or field label, and also the collector's name.

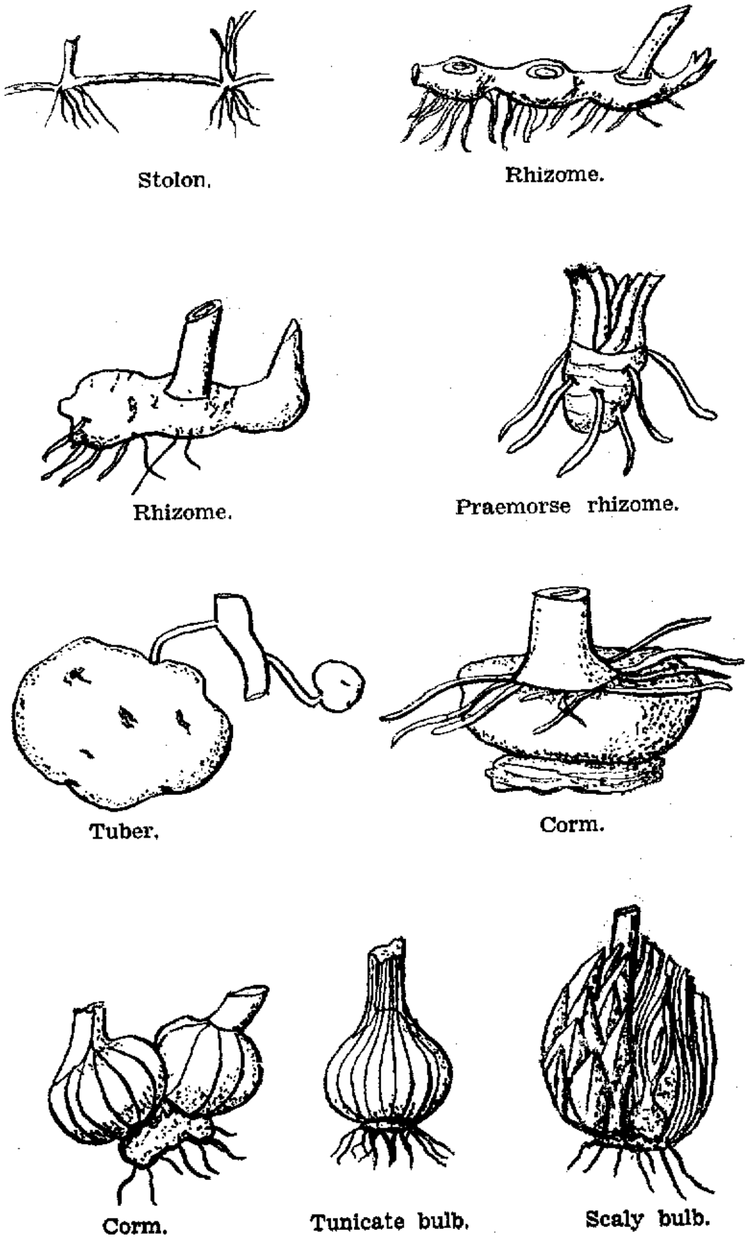
4. Mounting: When dry, specimens may be kept either loose in a clean sheet of paper, or they may be mounted on somewhat stiff paper of uniform size, (a convenient size of mounting sheet is 17.5 by 14.5 inches) or in an album. The specimens may be carefully gummed to the final sheet, or fixed down with gummed strips, similar to stamp mounts, or stitched on to the sheets with thread and needle. Space must be left (usually in the right hand bottom corner) for the final label, or to write in the details on the sheet itself. The specimens, when complete, should be put away in a suitable box or cabinet for safety. A collection of plants preserved in this way is called a HERBARIUM. Some insecticide must be included in the cabinet to keep off insects.

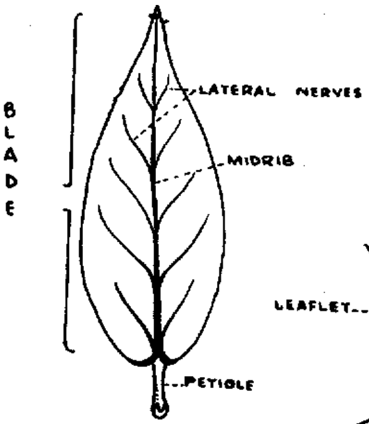
5. Naming: The naming of specimens can be done at any time. The novice should seek the assistance of a botanist in the beginning until he is able to 'fend' for himself.

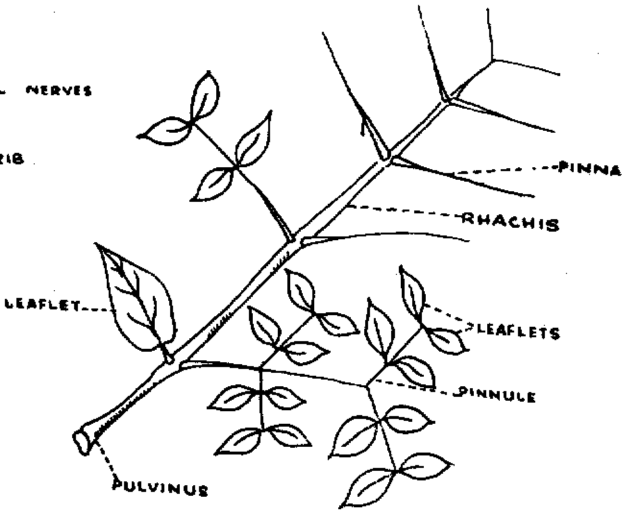
ROOT FORMS

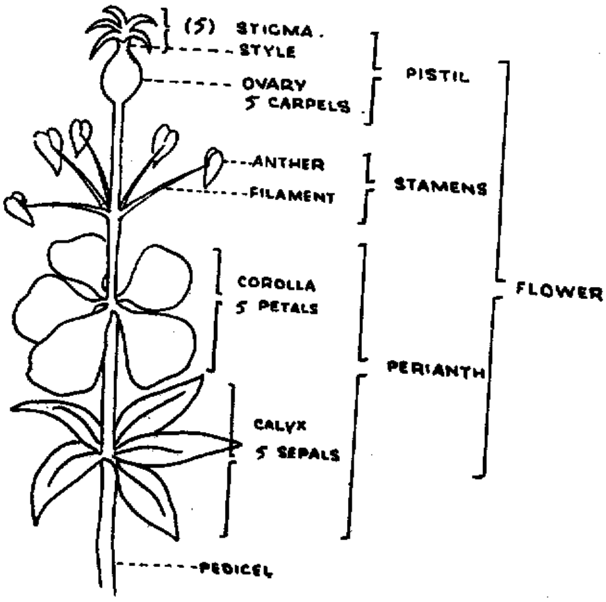


UNDERGROUND STEMS

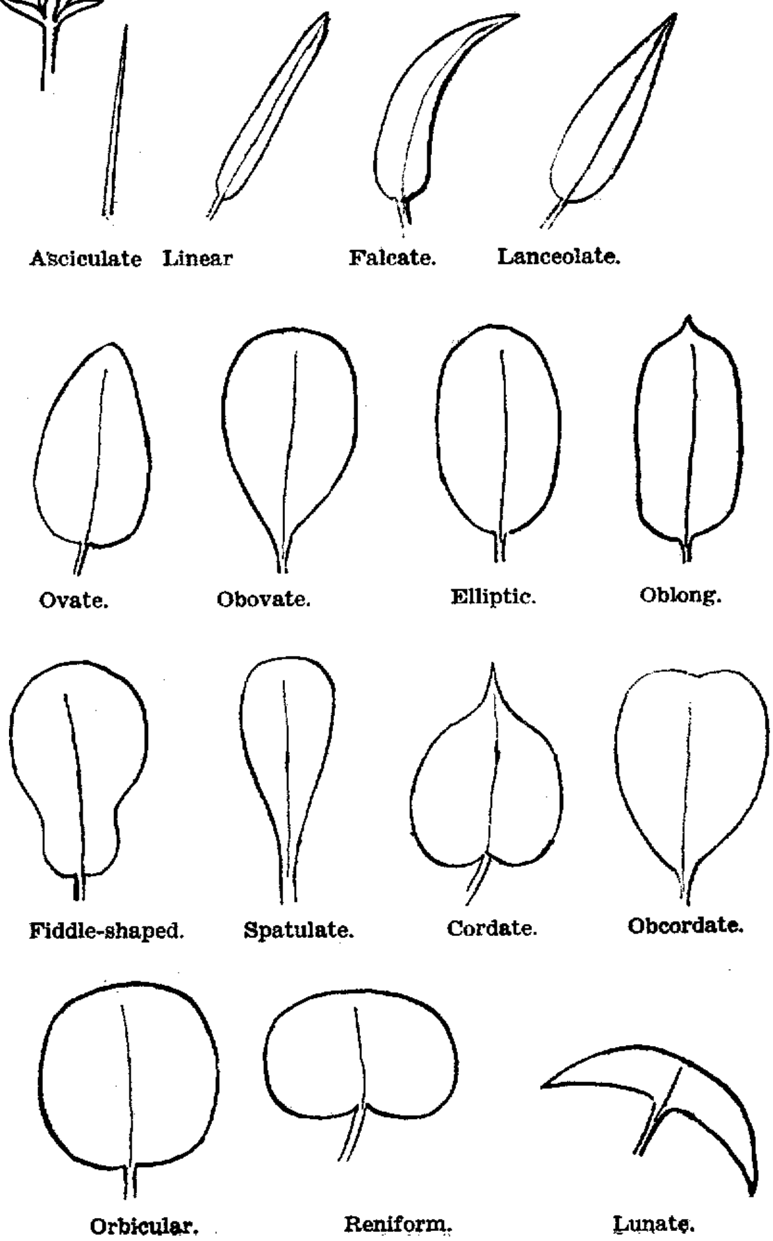






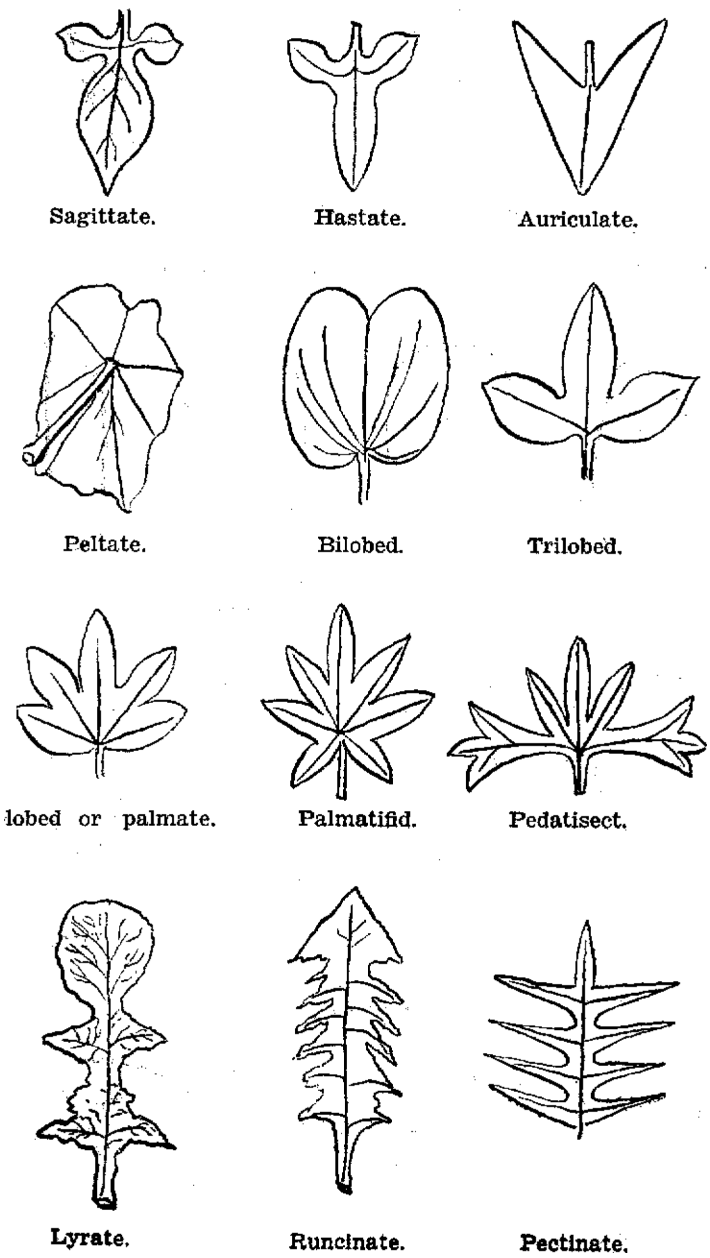




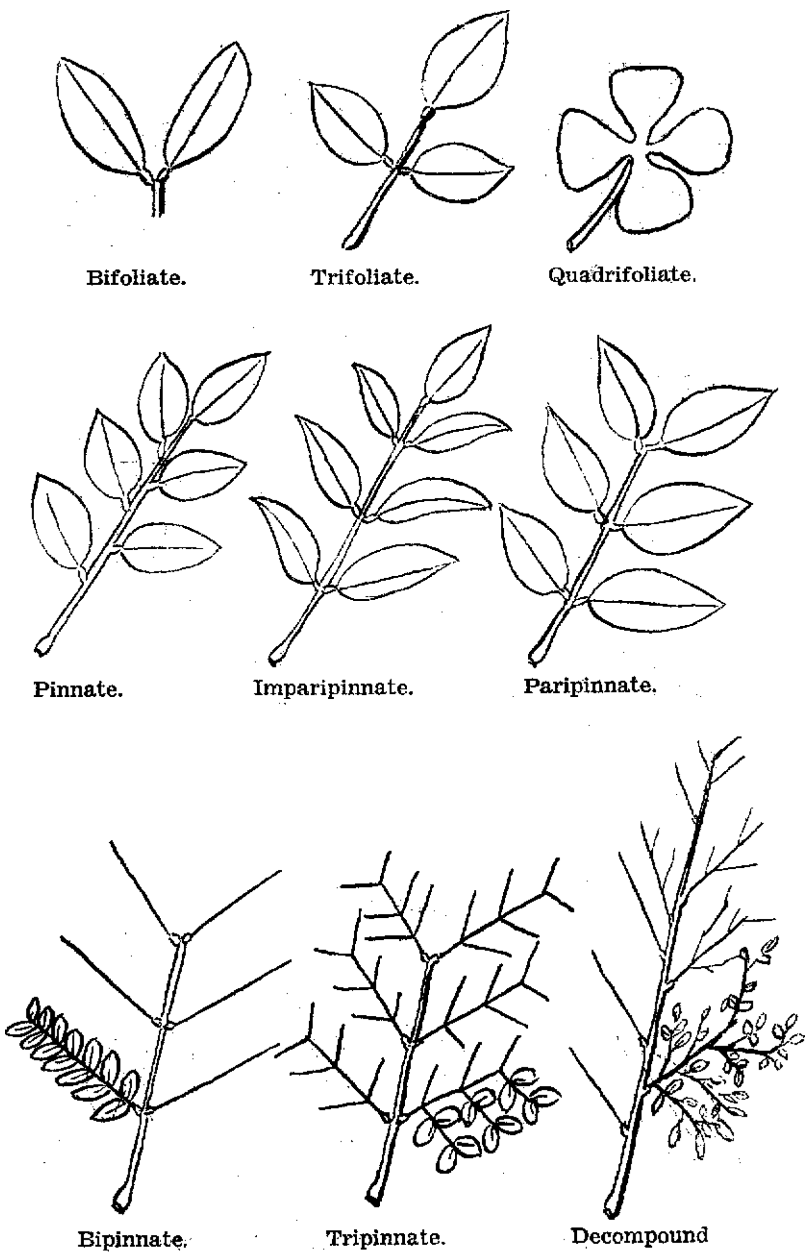


SIMPLE LEAVES

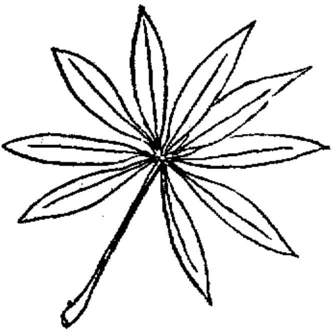
SIMPLE LEAVES



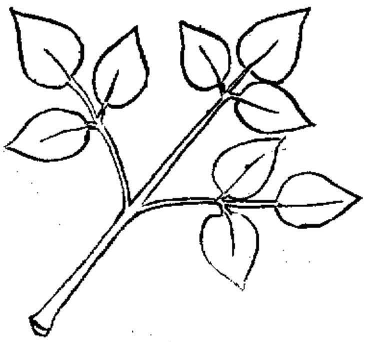
COMPOUND LEAVES



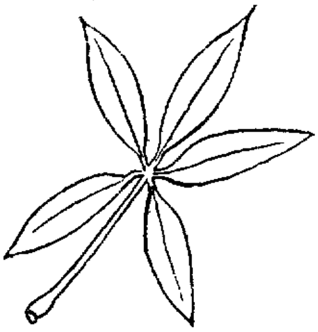
COMPOUND LEAVES



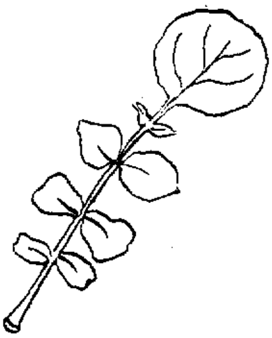
Digitate.



Ternate.



5-foliate or digitate.

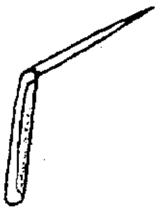


Lyrately pinnate.

PETIOLES



Winged.



Sheathing.



Decurrent.



Amplexicaul.

LEAF TIPS



Acute.



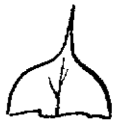
Obtuse.



Notched.



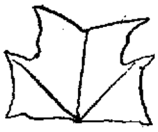
Apiculate.



Acuminate.



Caudate.



Truncate.

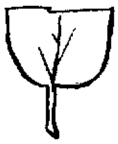


Rounded.

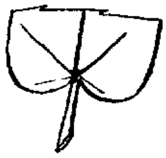
LEAF-BASES



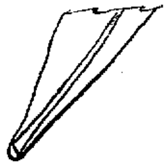
Cuniate.



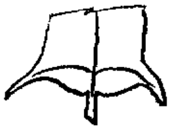
Rounded.



Cordate.



Decurrent.



Sagittate.



Truncate.

LEAF BASES

LEAF MARGINS


Serrate.


Crenate.

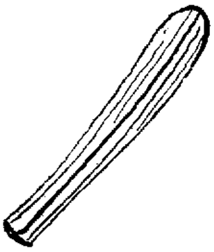

Sinuous.


Undulate.

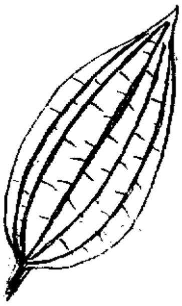

Erose.


Spinous.

VENATION


Parallel.


Reticulate.


Ribbed.

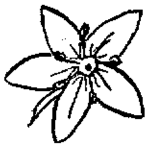
POSITION OF LEAVES


Opposite.


Alternate.

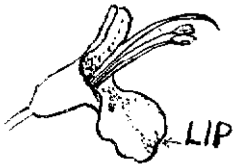

Whorled.

FLOWERS


Stellate.


Campanulate.


Funnel-shaped.

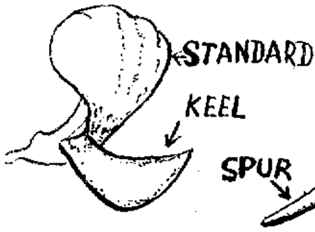


Labiate.

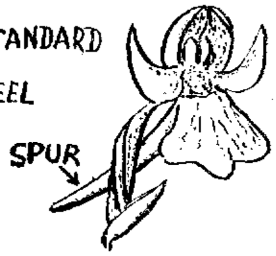

Personate



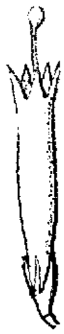
Ringent (gaping).



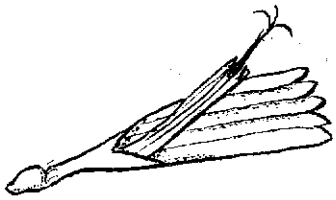
Papilionate corolla.



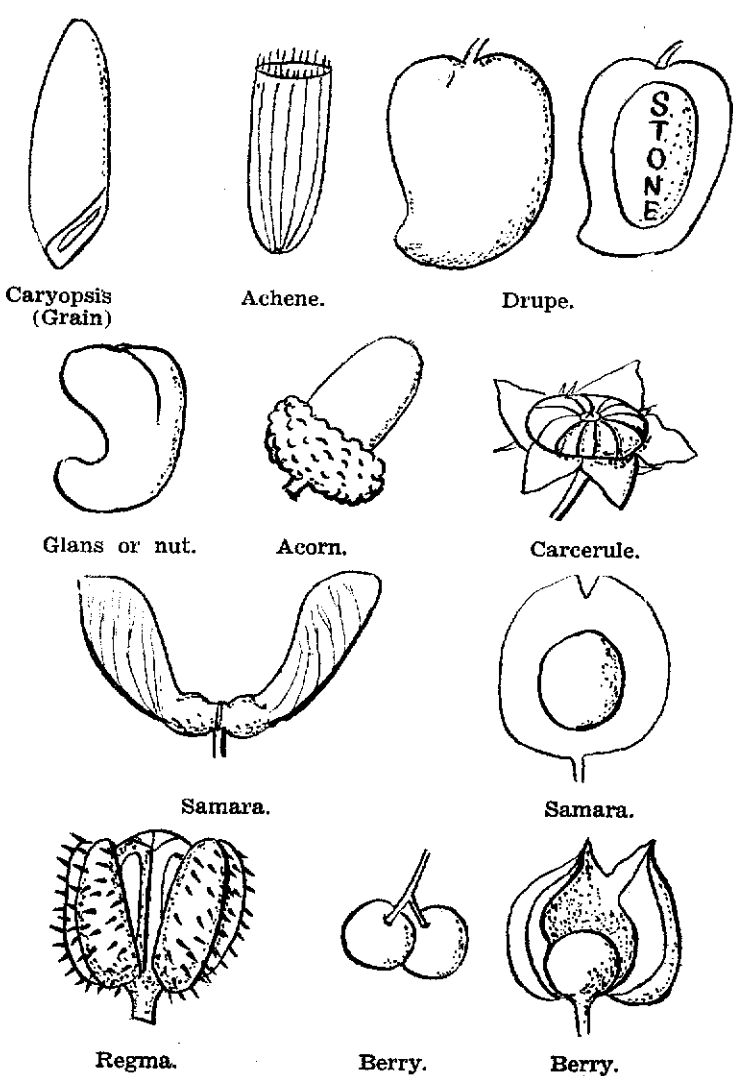
Spurred corolla.


Tubular.

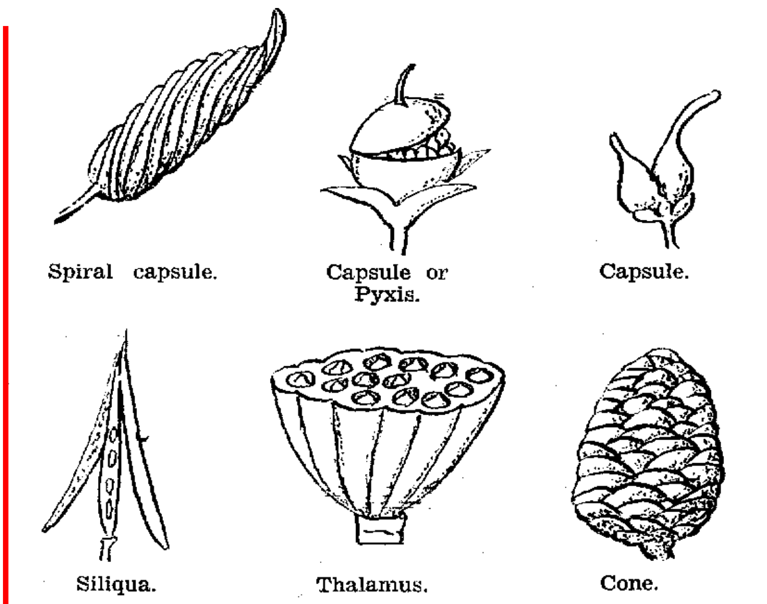

Digitaliform.


Ligulate.

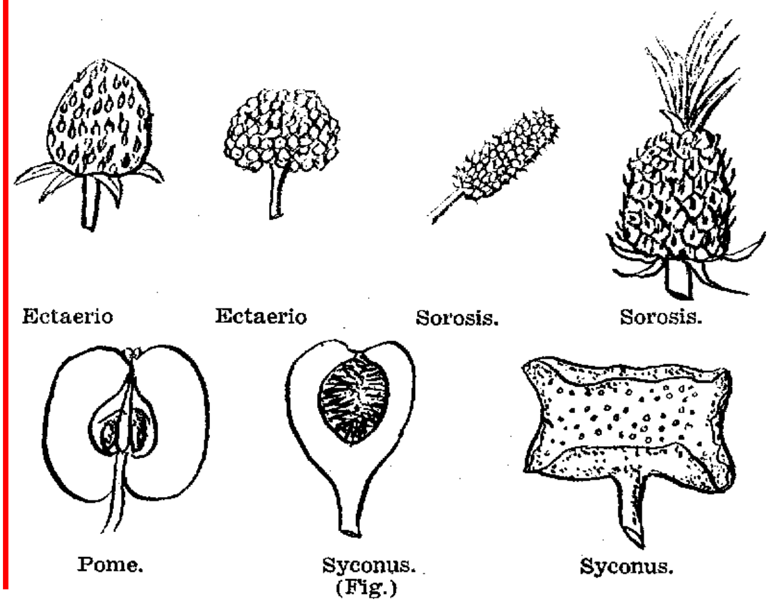
FRUITS



FRUITS



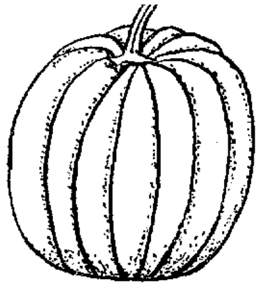
SPURIOUS FRUITS



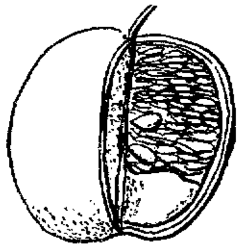
FRUITS



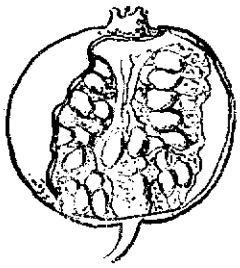
Amphisarca.



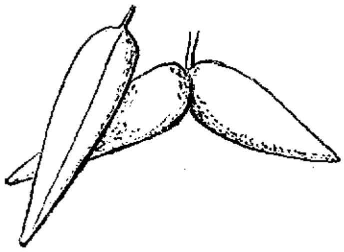
Pepo.



Hesperidium.



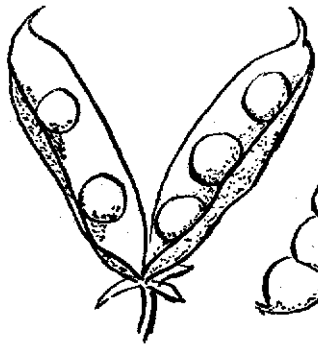
Balausta.



Follicles.



Follicles.



Pod or legume.



Lomentum or legume.



Spiral legume.

1A. & IB. KARNIKAR

Pterospermum acerifolium Willd. (Order: *Sterculiaceae).*

Pterospermum a combination of two **Greek** words meaning winged seed. *Acerifolium* in allusion to the leaves resembling those of the Maple—*Acer.*

Description: A large handsome evergreen tree with large irregularly shaped leaves, green above and greyish white beneath. Leaves very variable in shape and size 10 to 14 in. by 6 to 12 in .orbicular, oblong, margins variously lobed and indented, cordate, or peltate (petiole arising towards the 'centre' of the leaf below), smooth and shining above, whitish or rusty-coloured beneath with adpressed hairs. Flowers large, solitary or in pairs, in the axils of the leaves, fragrant; calyx composed of five thick, long sepals which curl backwards as the flower opens, 4-5 in. long; petals 5, at first arranged in a tubular form (when fresh), finally falling apart and withering early, slightly shorter than the sepals. Fruit a capsule 4 to 6 in. long by 2 to 3 in. oblong, five-angled, covered externally with a dense coating of "woolly" hairs. Seeds oblique with a large thin papery wing.

Distribution: The sub-Himalayan tract and outer Himalayan valleys, and hills up to 4,000 ft, Bengal, Assam, Burma, N. Kanara.

Gardening: Propagated by seed.

Uses: The down on the leaves is used by the hill people to stop bleeding. The wood is used for making planking; it may also be used in the manufacture of furniture. It takes a good polish. The leaves are employed for packing. The cut branches and sepals exude a mucilage when put into water: The sepals are used medicinally.

Note: The flowers open at night and fall by morning; they are sweet-scented. The flowers are visited by bats.



No. 1a KARNIKAR

(Pterospermum acerifolium)



No. 1b KARNIKAR

(Pterospermum acerifolium)

2. BHENDI TREE

Thespesia populnea Soland. (Order: *Malvaceae)*



Thespesia is derived from the Greek *Thespesios* meaning divine, in allusion to its being planted near churches (temples). *Populnea* refers to the leaves which resemble those of the Poplar.

Description: A small tree reaching 30 to 40 ft. Leaves broadly egg-shaped, acuminate at the tip and heart-shaped at the base, 3 to 6 in. long by 3 to 4 in. wide, with 5 to 7 prominent veins, stalk 2 to 4 in. Flowers large appearing as though made of yellow crinkle paper which turn purplish with age; calyx cup-shaped, shallow; petals 2 to 3 in. long with a chocolate or purple centre to the flower. Stamens arranged on a tassel-like 'tongue;' the 'bell' is formed by the corolla. Fruit a capsule, somewhat rounded, but usually flattened at the top.

Distribution: Coastal forests of India and Burma; tropical Asia, Africa, and the Pacific Islands. Often planted as a roadside tree.

Gardening: It is easily grown from seed or from cuttings and grows rapidly. Cuttings of all sizes take well, but trees from large cuttings are believed to be short-lived. It prefers a light porous soil. The tree flowers almost throughout the year, but chiefly in the cold weather.

Uses: The bark produces a strong fibre. The wood is tough and fine-grained, arid has been used for gun-stocks and cart wheels. The capsule and the flowers are said to give a yellow dye.

Note: The large, pale-yellow, crinkle-paper-like flowers have a deep chocolate centre which is visible when the petals are parted. On fading the flowers turn pink-purple before falling.

3. THE TREE MALLOW or BELAPATA

Hibiscus tiliaceus Linn. (Order: *Malvaceae).*



Hibiscus is the Latin name for a Mallow; *tiliaceus* is derived from *Tilia,* the generic name of another tree in allusion to its close resemblance to one of the members of that genus.

Description: A moderate-sized semi-deciduous tree reaching 35 to 45 ft. in height. Leaves 4 to 5 in. long, heart shaped, suddenly ending in an acuminate tip, margin entire or crenulate; petiole 1.5 to 2.5 in. long. Flowers in racemes at the ends of the branches. Pedicils short, stout. Calyx of five separate sepals. Below the calyx are 10 bracts *(involucral bracts)* forming a ring round it. Corolla 2-3 in. across composed of 5 crinkly petals. The stamens are arranged on a central column surmounted by the stigma. Fruit a capsule, round, with a short beak, and enclosed in the persistent calyx.

Distribution: All tropical regions, particularly near the sea.

Gardening: Propagated by seed.

Uses: The bark is used as medipine. The root is said to be a febrifuge, and is employed in the preparations of embrocations. The wood is used for fuel in India, but in Tahiti planking is prepared from it. A useful fibre is obtained from the bark which is employed in the manufacture of cordage, mats, and possibly paper.

Note: The flowers resemble those of the Bhendi Tree in colour and texture, but they do not assume the bell-shape of the latter. When faded the petals open wide (flat) and turn red-purple and finally black—the petals of the Bhendi do not open in this manner. The flowers appear during the cold season — November to January.

4. SONCHAMPA

Michelia champaca Linn. (Order: *Magnoliaceae).*

Michelia named in honour of P. A. Micheli, a Florentine botanist (1679-1737). *Champaca* is derived from the vernacular name.



Description: A tall handsome evergreen tree attaining a height of 110 ft. or more. Leaves 7 to 10 in. long by 2 to 4 in. wide, lance-shaped, with an acute or acuminate tip, glabrous above but softly hairy beneath, petiole 0.75 to 1 in. long. Flowers 2 to 2.5 in. across, solitary, strongly scented, enclosed in greyish-yellow spathe-like bracts which soon fall; sepals and petals together number 15 or more; pedicel short and thick. Fruits composed of capsules, 0.75-inch in diameter, marked with small white points. Seed reddish turning brown.

Distribution: Eastern sub-Himalayan tracts and lower hills up to 3,000 ft., Assam, Burma, Western Ghats, southern India. Much cultivated for its fragrance.

Gardening: The seeds should be sown as soon as possible after collection. The tree demands a moderate amount of light and thrives best in a moist climate and moist, deep soil.

Uses: The fragrant flowers are used in religious ceremonies and by women for ornamenting the hair. A yellow dye is extracted from the flowers by boiling, and is used as a base for other colours. Various parts of the tree are used medicinally. The wood is good and would be serviceable for planking and for furniture, but the tree is seldom cut on account of it being looked upon as sacred. It is commonly planted in the neighbourhood of temples. The trade name is *Champa.*

Note: The tree is not found wild in the Bombay Presidency.

5. FARANGIPANI, CHAMPA or PAGODA TREE

Plumeria acutifolia Poir. (Order: *Apocynaceae).*

Plumeria named in honour of Charles Plumier (1664-1706) a French priest, traveller and botanist. *Acutifolia* in reference to the sharp-pointed leaves.



Description: A small deciduous tree reaching 15-25 ft.; stem crooked, often producing short adventitious roots; bark rough and scaly, greyish; producing milky juice on injury. Leaves in crowded spirals at the end of the branches; reaching one foot or more long, lanceolate and tapering at both ends, sometimes rounded; veins parallel, prominent. Flowers in upright clusters at the ends of the branches, large, waxy white with yellow centres, funnel-shaped with 5 spreading petals; the left margin has a tendency to curl, stamens inserted deep within the flower; highly scented. Fruit composed of two horn-like follicles, 4-6 in. long; seeds with a tassel of silk.

Distribution: A native of Mexico and Guatemala, but evidently introduced into Eastern countries at a very early date.

Gardening: Easily propagated by cuttings which should be allowed to wilt before planting. At first they should not be kept too moist or they rot. The hot season is the best time for planting.

Uses: Various parts of the tree are used medicinally both internally and externally. The bark is recommended in venereal diseases: against intermittent fever and mixed with other ingredients is believed a remedy for diarrhoea. However, excessive use is fraught with danger, and death has been known to result from over dosage. The leaves are used as a poultice to reduce swellings.

Note: The tree seldom fruits in India. It is often associated with temple sites.

6. YELLOW OLEANDER



Thevetia neriifolia Juss. (Order: *Apocynaceae).*

Thevetia in honour of a monk of the fourteenth century, Andre Thevet; *neriifolia* derived from *Nerium* the generic name of the oleander and *folia,* leaves, in illusion to the close resemblance of the leaves to those of the oleander.

Description: A large evergreen shrub or small tree, 15 to 20 ft. high. **Leaves** crowded along the branches, linear, 5 to 6 in, long by 3/8 to 1/4 in. wide, tip acute, base narrow. Flowers showy,, trumpet-shaped, fragrant, 2.5 to 2.75 in. long, The anthers and stigma are at the bottom of the funnel protected by tufts of hairs against unbidden guests. The stigma is somewhat crown-shaped with a shallow cleft at the top. The fruit is about the size of a golf ball, somewhere obtusely angular. Seed somewhat triangular in outline hard.

Distribution: A native of the West Indies and Mexico.

Gardening: Propagated by seed.

Uses: The plant yields a poisonous, bitter and cathartic juice. The bark is used as a febrifuge and is said to have anti-periodic properties. Large dose acts as an acrid purgative and emetic, but taken in too great doses it is poisonous. Great caution is required in trying out these remedies. A bright yellow oil is obtained from the seeds, it burns well, and is also used in medicine. The kernels are bitter and if chewed produce numbness and heat to the tongue.

Note: The tree flowers almost throughout the year, but the principal period appears to be just after the monsoon. They open, in the morning, and are visited by insects, humble bees *(Xylecopa)* and fall by the evening or next morning.

7. THE QUEEN'S FLOWER or MOTA-BONDARA

Lagerstroemia flos reginae Retz. (Order: *Lythmceae),*

Lagerstroemia named in honour of Magnus V. Lagerstroem, a Swede and a friend of Linnaeus. *Flos-Reginae* means flower of the queen.



Description: A moderate-sized deciduous tree reaching 60 ft. in height. Leaves 4 to 8 in. long by 1.5 to 3 in. wide, oblong-lanceolate or elliptic, tip somewhat acute, base acute, or rounded, nerves 10 to 13 pairs, prominent. Flowers arranged in large panicles at the ends of the branches, 2 to 3 in. across. Calyx cup-shaped with 12 to 14 prominent ridges, with 6-7 small teeth on the rim of the cup. Petals 6 to 7 in number, 1 to 1.5-inches long, rounded and crumpled, spreading. Stamens many, Fruit a capsule elliptic or spherical in shape, with the remains of the style crowning its summit.

Distribution: India, the Western Peninsula, Assam, Burma and Ceylon; Malaya arid China. Often cultivated for the beauty of its flowers.

Gardening: Propagated by seed. The seeds should be sown in pots and the seedlings transferred to the ground in the second or third season as ..the plant is slow-growing in the first year or two; later the development is more rapid.

Uses: The tree exudes a resin. The wood is tough and suitable for under-water purposes but not underground: used in India for boats, canoes, gun-carriages, carts, ammunition boxes, buildings, etc.; in Ceylon it is used for casks and many other purposes. In Burma, where it is the most important timber tree, it is largely employed. In medicine the roots are prescribed as an astringent. Every part of the tree is of some repute in native medicine. The seeds are said to be narcotic; the bark and leaves purgative. In the Andamans the fruit is used as an application for aphthous ulcers in the mouth. Trade name is *Jarul.*

8. KUMBHA or PATANA OAK

Careya arborea Roxburgh. (Order: *Myrtaceae),*

Careya in honour of William Carrey, the founder of the Serampur College, a missionary and scholar. *Arborea,* in Latin, meaning tree-like.



Description: A moderate-sized deciduous tree, 20 to 60 ft. Leaves 6 to 12 in. long by 3 to 7 in. wide, usually stalk less, broad ovovate, with a rounded or slightly acuminate tip. Flowers large, creamy white, strongly ill-scented, 2 to 2.5 in. across, arranged at the ends of the branches, stamens very numerous. Fruit spherical, 2 to 3.5 inch in diameter, hard and fibrous, much like an apple in appearance.

Distribution: The tree is found sporadically throughout the greater part of India and Burma. It ascends to 5,000 ft.

Gardening: Propagated by seed.

Uses: The bark yields a good fibre for coarse cordage and sacking. It is also used as a tan and a dye. In medicine the bark is used as an astringent; when moistened it gives out much mUcil-age and is utilized in the preparation of emollient embrocations. The flowers are given as a tonic after child-birth, and the dried calyces are sold in the market under the name *vakumbha* as a demulcent in coughs and colds. As a food the fruit is eaten in the Punjab and is also given to cattle. In Oudh flour is made from the bark as a famine food. The seeds are regarded as poisonous. The timber is very durable and fairly hard and is used in the production of agricultural instruments, gun-stocks, etc. The wood is water resistant and is much admired for axles.

Note: The flowers appear about February-March and the fruit remains on till late into the rains. The flowers emit a strong disagreeable odour. The fruit exudes mucilage. .

9. MUDILLA

Barringtonia speciosa Forest. (Order: *Myrtaceae),*

Berringtonia is derived from the name Barrington in whose honour it was named, an English naturalist and antiquary. *Speciosa* refers to the beauty of the large flowers.



Description: An evergreen tree with large leathery foliage attaining a height of 40 to 60 ft. Leaves 10 to 14 in. long by 4 to 7 in. wide, leathery, shining obovate, narrowed into the petiole, tip rounded. Flowers, large, in bunches at the ends of the branches. Calyx dividing into two, petals 4, surrounding the dense tuft of thread-like stamens. Fruit bluntly four-angled, pendulous, crowned with the persistent calyx and the remains of the style, fibrous, containing a single seed.

Distribution: India, near the sea.

Gardening: Propagated by seed. It grows into a handsome tree, and is sometimes planted along roadsides.

Uses: None known,

Note: As the Mudilla generally grows on the banks of rivers and lagoons its fruit is specially adapted for transport by water—it is a good example of a water-dispersed seed. The flowers appear from July to September.

10. ONE-STAMENED BAUHINIA



Bauhinia monandra Kurz. (Order: *Leguminosae).*

Bauhinia in honour of two German botanists of the 16th century. John and Caspar Bauhin. *Monandra* refers to the single fertile stamen.

Description: A small deciduous tree attaining a height of 20 to 25 ft. Leaves simple, bilobed, somewhat rounder very broadly ovate, long by wide, tips of the lobes blunt, base truncated, thin and papery in texture, nerves 11 to 13 arising from the base, Flowers arranged in short terminal, softly hairy racemes at the end of the branches, large opening singly or in pairs. Calyx sheath-like, softly downy externally. Petals 5, 1.5 to 2 in. by 0.5 in. Or more wide, obovate, tip rounded, base narrowed margins crinkled, one of the petals, the standard, is more colourful than the others. Stamens only 1 fully developed, hence the scientific name, as long as the petals. Fruit a pod, 6 to 8 in. long by f to 1 in. broad, ending in a long beak.

Distribution: Burma, Mataban. Frequently cultivated.

Gardening: Propagated by seed. An ornamental tree.

Uses: None known.

Note: This *Bauhinia* is frequently mistaken for another member of the genus, *B. variegata,* from which it differs greatly in the texture of the leaves and the colour of the flower. About Bombay the flowers appear about March or April together with the young leaves and the tree continues to flower till about October, but not in such profusion as when it first flowers.

11. THE PURPLE BAUHINIA

Bauhinia purpuria Linn. (Order: *Legutriinosae).*



Bauhinia in honour of two German botanists of the 16th century, John and Caspar Bauhiri; *purpuria* in allusion to the colour of the flowers.

Description: A moderate-sized deciduous tree 40 to 50 ft. high. Leaves simple, bilobed, 4 to 5 in. in diameter, roundish, about as long as broad, the two lobes separated from 1/3 to 1/2 their length from the tip. Tips sub-acute or rounded, base cordate; nerves 9 to 11 radiating from the base; petiole 1-1.5 in. long. Flowers in terminal and axillaries, few-flowered corymbs-like racemes; calyx somewhat tubular, splitting on one side or into two, with 5 short; teeth; petals If to 1.75 in. long by 2.5 in. wide, oblanceolate, narrowed towards both ends. Stamens 3-4 only fertile. Fruit a pod, 6 to 12 in. long by .75 in. wide, somewhat woody, flat. .Seeds 12 to 16, 5/8 by 1/2 in. flat oblong-ellipsoid.

Distribution: It grows wild sporadically throughout India, particularly in the hill tracts. Frequently cultivated for its showy flowers. It is also found in China.

Gardening: Propagated by seed. The seeds should be sown in pots in April or May and regularly watered. The seedlings appear in about 4 to 10 days and should be transplanted during the rains.

Uses: The tree yields a gum. The bark yields a fibre, and is also used in dyeing and tanning. The wood is used for making agricultural implements and for building. The leaves are used as fodder and the flowers as a pot herb in curries and made into pickle *(chutni).* The root is tonic and carminative; the flowers laxative, and the bark astringent. The bark or root and flowers, mixed with rice water, are used as a poultice for boils and abscesses. A decoction of the bark is recommended as a useful wash for ulcers. The bark of the underground root is poisonous even in small quantity,

Note: The flowers appear after the rains and the fruit remains on the tree till the next hot season.

12. KANCHAN or VARIAGATED BAUHINIA

Bauhinia variagata Linn. (Order: *Leguminosae),*

Bauhinia, in honour of John and Caspar Bauhin, two sixteenth century herbalists. *Variagata* in allusion to its variability, particularly the colouring of the flowers.



Description: A medium-sized deciduous tree reaching 30 ft.; bark dark brown, nearly smooth. The young parts are covered with a brown felting. Leaves bilobed, 4-6 in. long as broad as or broader than long with a median cleft reaching 1/4 - 1/3 the way, lobes blunt. Flowers large fragrant, in few-flowered racemes at the ends of the branches or in the axils of the leaves; calyx tube 1/2-1 in. long, spathe-like; petals 5, 2-2.5 in. long, obovate, rose-pink with prominent veins; stamens 5, fertile. Pods 6-12 in.; seeds 10-15.

Distribution: Sub-Himalayan tract from the Indus eastwards. Assam, Burma and China; Chota Nagpur, Central Provinces and Western Peninsula.

Gardening: Propagated by seed. Cuttings root with difficulty. Often planted in gardens.

Uses: The tree yields a gum having similar properties to Cherry Gum; bark used for tanning and dyeing. Leaves used for the wrappers of *bhedis.* Seeds yield oil. Wood used for agricultural implements and fuel. The leaves, buds and young pods are eaten as a vegetable, and the buds are often pickled.

13. GALGAL or YELLOW SILK COTTON

Cochlospermum gossypium DC. (Order; *Bixaceae).*

Cochlospermum, a combination of two Greek words: *Kochlos,* shell or snail, and *sperma,* a seed, probably in allusion to the character of the fruit. *Gossypium,* cotton, in reference to the silky wool around the seed.



Description: A small deciduous tree, 10-20 ft,, often with a stout trunk, smooth ashen bark and numerous branches; young branches covered with a soft down and marked with the scars of the fallen leaves. Leaves distant, disposed towards the ends of the branches, petioles 6-10 in. long, lamina 3-10 in. across, plamately fid with 3-5 lobes, margins serrate or dentate, dark green above, greyish below with a whitish down. Flowers in terminal clusters, 2.5-3.5 inches across, bright golden yellow; sepals 5, silky, overlapping, persistent or deciduous; petals 5, obovate, spreadings; stamens numerous, style long. Fruit a somewhat large capsule, 2.5-4 in. across and slightly longer, reddish before drying; seeds numerous, kidney-shaped, embedded in short silky wool.

Distribution: A tree of the dry hilly, stony regions of peninsula India and the sub-Himalayan tract up to 3000 ft. and the dry zone of Burma and some of the islands of the Eastern Archipelago.

Gardening: Propagated from seed. Inclined to be slender and taller in cultivation.

Uses: In different districts various parts of the tree are used medicinally, as food and economically. The transparent gum is used by shoemakers and as a substitute for gum Tragacanth which it resembles. The seeds are roasted and eaten. A decoction from the wood mixed with flour is considered nutritious. Young leaves are used as an hair wash. The dry flowers and leaves are used as a stimulant.

14. THE SCARLET STERCULIA or KASHI

Erythropsis colorata Burk. (Order: *Sterculiaceae).*

Erythropsis from Greek in allusion to the red colouring of the flowers. *Colorata* means coloured in reference to the bright colouring of the flowers (calyx).

Description: A moderate-sized deciduous tree. Leaves large, broader than long, 4 to 8 by 5 to 9 in., very variable in shape, commonly 3-lobed, lobes triangular, acuminate at the tips, base deeply cordate, stalk 4 to,12 inches long, nerves 3 to 5 from the top of the petiole to the tips of the lobes. Flowers about 1 in. long, many together appearing at the ends of the branches when the tree is leafless. Calyx funnel-shaped with small triangular lobes, covered with a scarlet red 'dust.' Fruit composed of 3 to 5 papery follicles about three inches long, leaf-like, elliptic, veined, with two seeds attached to the margin of the follicle.



Distribution: The Satpuras up to 3,700 ft.; Western Ghats from South Kanara to Travancore, Konkan and the Deccan Forests, N. Circars, Mt. Abu, East Bengal, Burma, Andamans. Ceylon, Indo-China, Siam.

Gardening: Propagated by seed. The seeds should be planted soon after they mature.

Uses: The bark yields an inferior fibre, strong but coarse, occasionally used for ropes. The leaves are used as cattle fodder.

Note: The tubular flowers are visited by sun-birds, green bulbuls and some other nectar-feeding birds. Birds probably form the chief pollinating agents. The papery follicles dry soon after reaching maturity and are easily detached by the hot dry winds prevalent about that time. They act as sails to the seeds which are also easily separated from them,

15. TATTELE

Pterygota alata R. Brown. (Order: *Sterculiaceae).*

Pterygota derived from a Greek work referring to the winged nature of the seed. *Alata* refers to the tallness of the species.

Description: A tall deciduous tree with a straight trunk and smooth ashen bark; young parts covered with a dense, golden, stellate pubescence. Leaves crowded towards the ends of the branches, 4-11 in, by 3-8 in., ovate cordate, acute or shortly acuminate, glabrous, 3-7 nerved; petioles 2-4 in. long, round, slightly hairy. Flowers about 1 in. across in few-flowered racemes, of males and females, arising in the old axils below the present leaves; pedicels short, densely hairy; calyx of 5 or 6 (sometimes 7) thick, fleshy, linear-lanceolate lobes, externally coated with dense rusty-coloured, stellate down, lobes streaked with red and yellow veins. Male fls. staminal column with the anthers at the top; female fls. with urn-shaped ovary surmounted by 3-5 stigmas. Fruit a large follicle, sub-globose, 5 in. in diameter, hard and woody; seeds about 40 furnished with a large wing, 3 by l.5in.



Distribution: Silhet, Chittagong, Pegu and the Andamans; rare in Kanara. Planted in many gardens.

Gardening: Propagated by seed. An handsome tree.

Uses: The seeds are eaten in Burma.

16. THE CUSTARD APPLE or SITHAPHAL



Annona squamosa Linn. (Order: *Annonaceae).*

The name *Annona* is derived from the Haitian name *Anon; squamosa* meaning in Latin, scaly, in allusion to the scale-like texture of the outside of the fruit.

Description: A small deciduous tree reaching 20 ft. Leaves 1.5 to 3 in. long by 0.75 in. wide, long-lance-shaped or elliptical, tip blunt or slightly pointed; leaf-stalk 0.5 to 0.75 in. long. Flowers solitary or several together arising from the axils of the leaves, or from the old wood; flower-stalk 0.5 to 0.75 in. long, the flower is represented by tree fleshy petals hanging downwards. Fruit 2 to 4 in. across, rounded with a deeply furrowed and wrinkled skin. The seeds are embedded in a white edible pulp; they may be dark brown or black in colour.

Distribution: The Custard Apple is a native of tropical America; cultivated throughout the tropics for its fruit. It is frequently found as an escape.

Gardening: It does well in ordinary well-drained soil, up to an elevation of 3,500 ft. The fruits are marketed from July to September. Bats attack the fruits.

Uses: The bark affords an inferior fibre. The seeds yield oil and tree resins, the latter appear to be acrid principles and are useful insecticides. The fruit, bark, leaves and roots are used in medicine, the roots being considered a drastic purge. In the West Indies a kind of cider is made from them.

Note: The Custard Apple is variously known as the Sugar-Sop or Sugar-apple, or Sweet-Sop. Some people believe that the Custard Apple causes fever, this belief is not wholly true but certain individuals may display a singular idiosyncrasy in this regard just as others do with certain forms of food.

17. THE SOUR SOP or SHERIMAIH

Annona muricata Linn. (Order: *Annotmceae).*

Annona, for the derivation of the word look under the previous species. *Muricata* in allusion to the spiny surface of the fruit.

Description: A small evergreen tree with dark green shining foliage reaching 20 to 25 ft. high. Leaves 3 to 7 in. long by 2.25 to 3.25 wide, broadly elliptic or obovate, tip suddenly narrowed into an acute point, base narrowed into the petiole, sometimes slightly unequal. Flowers somewhat large with a thick, ridged, pendant corolla, on a short stalk from the ends of the branches or from the old wood; sepals 3, inconspicuous; petals in two series of 3 each, the outer three thick, heart-shaped, the inner shorter, broadly ovate, concave; stamens and stigmas forming a miniature fruit in appearance. Fruit large, 5 to 8 in. long and 3 to 5 inches in diameter, covered with prickles.



Distribution: A native of Tropical America, but now cultivated throughout the tropics. Not as commonly met with as the other two Annonas.

Gardening: Propagated by seed and from buds. It begins to bear at a very early age.

Uses: A drink is made from the juice of the fruit and the pulp is used in making jellies and other preserves.

Note: The flowers are highly scented. The tree flowers throughout the greater part of the year, but the proper period appears to be from August to January.

18. BULLOCK'S HEART or RAMPHAL

Annona reticulata Linn. (Order: *Annonaceae).*

Annona in Latin, the 'year's harvest' suggested by the Haitian name *anon* applied to one of the species. *Reticulata* on account of the net-like sculpturing of the outside of the fruit,



Description: A small deciduous tree attaining a height of 20 to 25 ft. Leaves 4 to 7 in. long by 1 to 1.5 in. wide, oblong-lanceolate, tip sharp or blunt, base rounded, nerves 15 to 18 pairs. Flowers 2 to 4 together usually appearing on the old wood. Sepals very minute, petals arranged in threes, the 3 outer 1.25 by 0.25 in., the 3 inner very small (the flower appears as though it is composed of these only). Fruit 4 to 6 in. diameter rounded or somewhat heart-shaped. The final colouring makes the heart-like appearance of the fruit more realistic.

Distribution: The home of the Bullock's Heart is tropical America and the West Indies. Cultivated, but less extensively throughout India, than the Custard Apple.

Gardening: Grown from seed. The plant grows rapidly and thrives in most soils. It is very necessary to protect the fruit by nets or by bags at the time of ripening from the attacks of fruit bats.

Uses: Fruit is eaten.

Note: In the West Indies this fruit is referred to as the Custard Apple and the Custard Apple (as known in India) as the Sweet-Sop. The Bullock's Heart is seldom eaten, by Europeans.

19. ASUPALA

Polyalthea longifolia Benth. (Order: *Annonapeae).*

Polyalthea is derived from the combination of two Greek words meaning eventually 'many cures' in reference to the supposed medicinal properties. *Longifolia,* in Latin, referring to the length of the leaves.



Description: A tall handsome evergreen tree. Leaves 3 to 9 in. long 0.75 to 1.5 in. wide, narrowly lance-shaped tapering to a fine point, and shining, margin waved or crinkled, petiole 0.25 to 0.5 in. long. Flowers 1 to 1.5 in. across, petals six similar in shape to the leaves. Stamens many. Fruit egg-shaped about 0.75 in. long, rounded at both ends, smooth, turning almost black when ripe, several arranged at the end of a common stalk.

Distribution: The Ashok is indigenous to Ceylon. It is extensively planted as a roadside tree in India.

Gardening: Propagated by seed. The seeds should be planted soon after ripening of the fruit as they do hot keep well. The seedlings should be kept in pots till old enough to transplant as they do not transplant well. The tree is slow growing.

Uses: Planted as a shade tree. The bark is said to yield a good fibre. The wood is good, light and very flexible. It is used for drum cylinders, pencils, and boxes. In China it is used for matches.

Note: When the fruit is ripe the tree is visited by large numbers of bats which feed on them. Next morning the ground is scattered with the seeds—the remains of the banquet!

20. ALEXANDRIAN LAUREL or UNDI

Calophyllum inophyllum Linn. (Order: *Guttrferae).*

Calophyllum is derived from the Greek meaning beautiful leaved. *Inophyllum* in reference to the texture and veins of the leaves.

Description: A moderate-sized evergreen tree. Leaves 3 to 7 in. long by 3 to 4 in, wide, broadly elliptic, tip rounded, margins turned slightly downwards; leathery in texture, shining, lateral nerves close and parallel; leaf-stalk thick, f to & in. long. Flowers 3/8 to 7/8 in. across in small racemes 4-6 in. long arising one from each leaf axil. Stamens many. Fruit round 1 to 1.5 in. in diameter, smooth, covered with a waxy bloom, yellowish when ripe.



Distribution: Indigenous to India along the coasts, Burma and Ceylon; East African Islands, Malaya, Australia and Polynesia.

Gardening: A strikingly handsome tree with its dark green foliage and white, waxy flowers. The flowering apparently varies much with locality:—N. Kanara in the cold season (Talbot); Travancore, March to April (Bourdillon); Bombay, about June to August (McCann).

Uses: A greenish-coloured oil is expressed from the seeds, commercially known as *Pinnay* or *Bomba* Oil. The oil possesses a disagreeable odour, but it is extensively used for burning. It is also applied externally as a remedy for rheumatism. Mixed with *chaulmogra* oil it is used for skin eruptions. It is also used in the treatment of scabies, this point was recorded as far back as 1686 by Rheede, a Dutchman. The timber is used for the knees for boats. The trade name is *Poon.*

Note: The flowers open in the morning and are insect pollinated. The outer coat of the fruit is eaten by bats and the same animals are responsible for a certain amount of seed dispersal.

21. KARMAL

Dellenia pentagyna Roxburgh. (Order: *Dilleniaceae*).

Dillenia, named in honour of J. J. Dillenius (1684-1747), a noted botanist. *Pentagyna* in allusion to the flower having five styles.

Description: A moderate-sized deciduous tree, 30 to 70 ft. high. Leaves crowded at the ends of the branches, 10 to 14 in. long by 4 to 8 in. wide (reaching 4 ft. or more by 1 ft., in saplings), downy when young but eventually smooth and shining, nerves prominent ending in sharp points, leaf-stalk reaching 2 in., embracing the branch. Flowers 1 in. across arising in clusters from small tubercles on the old wood of the branches, petals with crinkled margins stamens numerous; pedicles 1.5 in. long. Fruit the size of a ping-pong ball, succulent.



Distribution: An inhabitant of the sub-Himalayan tract, ranging eastward to Bengal, Chota Nagpur, Assam and Burma; central, western and southern India.

Gardening: Propagated by seed. It requires plenty of light. It is sensitive to frost, but is able to withstand forest fires.

Uses: The large leaves are used to form a substratum for roof thatch. They are sold in bundles in some bazaars. The fleshly sepals are eaten by the hill people. Cordage is made from the fibres of the bark.

Note: The tree flowers during the early part of the year at a time when it is quite leafless.

22. GOLDAR

Sterculia guttata Roxburgh, (Order: *Sterculiaceae).*

Sterculia is derived from the Latin, *stercus,* meaning dung. (See under *S. foetida*). *Guttata* means spotted, probably in allusion to the colouring of the flowers.



Description: A small or large deciduous tree with the leaves crowded at the ends of the branches. Leaves simple, large, 5 to 9 in. long by 3 to 5 in. wide, egg-shaped or ovate-oblong, tip acute or acuminate, base rounded or sometimes nearly cordate (heart-shaped). Flowers appearing when the tree is leafless at the ends of the branches, arranged in racemose panicles 0.75 to 1 in. across, the petals, usually bent backwards. Fruit composed of 1 to 5 follicles, 3 to 4 in. long, boat-shaped. Seeds ovoid-oblong 0.75 in. long, shining, black.

Distribution: India, throughout the forests of South Kanara and the Ghats.

Gardening: Propagated by seed.

Uses: The bark of the younger parts of the tree yields a white flaxen fibre. A rough cloth was made from the fibre. The seeds are either eaten raw or after roasting.

Note: Monkeys (Macaques) are very fond of the seeds and may be seen tearing open the follicles before they are ripe. There are a number of irritant hairs at the base of the seed which the novice needs to be careful of. The flowers are visited by carrion and fruit flies on account of the evil scent. The insects probably act as the pollinating agents.

23. ULLU

Randia uliginosa DC. (Order: *Rubiaceae)*

Randia named in honour of Issac Rand. *Uliginosa* in allusion to its usual habitat, in swampy ground.



Description: A small tree 20 to 30 ft. high. The branches terminating in I to 2 pairs of strong, sharp thorns about 0.25 in. long. Leaves gather together in tufts on shortened branches. 2.5 to 5 in. long by 1.5- to 2 in. wide, obovate or obovate-oblong, tip rounded, and base tapered into the short petiole. Flowers appear singly at the ends of the shortened branches, 1.5 to 2 in. across, fragrant, petals usually five, sometimes 6. Fruit 2 to 2.5 in. long, ovoid or elliptic in shape, Crowned with the remains of the persistent calyx. Seeds many, closely packed in pulp.

Distribution: Throughout India and Ceylon. The tree is partial to damp situations.

Gardening: Propagated by seed.

Uses: The fruit is used as a colour intensifier in dyeing. It is eaten as a vegetable either alone or together with other vegetables in curries. It is also eaten boiled or roasted. It is also used as cattle fodder. Medicinally the fruit is used as a remedy in diarrhoea and dysentery. The unripe fruit is used as fish poison.

Note: The flowers appear from April to July.

24. ALU

Vangneria spinosa Roxb. (Order: *Rubiaceae).*

Vangueria is derived from the Madagascan name *Voa-Vanguer* for a species of the genus growing in the island. *Spinosa,* in allusion to the long, sharp spines.



Description: A small deciduous tree 20 to 30 ft. high with straight opposite woody spines, 0.5 to 1.5 in. long, along the branches. Leaves, opposite, 2 to 5 in. long by 1 to 0.75in. wide, acuminate at the tip with the base shortly narrowed into the petiole. Between the leaf-bases there is a small leaf-like expansion, the stipule—a character of the order to which this plant belongs. Flowers small, in clusters arising from the old leaf-scars beneath the new leaves. Fruit about 1 in, or more in diameter, pear-shaped or rounded, with 4 to 5 stones (pyrenes) embedded in the pulp.

Distribution: India, occasional in the dry forests of the Peninsula, both on the plain and on the hills; Burma and Java.

Gardening: Propagated by seed.

Uses: The fruit is eaten by the hill people and is often offered for sale in the bazaars. It has an agreeable, though perhaps acquired, taste, somewhat acid-sweet when ripe. The leaves are used as fodder.

Note: The fruit turn light shining brown when ripe, and emit an acid odour. Mature green fruit may be put in straw to ripen. The fruit ripens from June-August, but the greater part of them ripen by the end of June.

25. BER

Zizyphus jujoba Lam. (Order: *Rhamnaceae).*

Zizyphus is derived from the Arabic name *zizouf* a name given to one of the species. *Jujuba* Latinised form of the vernacular name *jujbe.*



Description: A small or moderate-sized thorny, deciduous tree reaching a height of 40 ft., sometimes more. Leaves simple, 1 to 2.5 in. long by 0.75 to 1.5 in. wide, alternately set along the branches, ovate-elliptic, rounded at both ends, minutely and irregularly toothed *(denticulate)* along the margins, 3-nerved, covered with a grey or russet down beneath. Prickles 1-2 at the base of each leaf-stalk, when two are present, one is usually straight and the other hooked. Flowers small in axillary clusters. Fruit a drupe 1/2 to 5/8 in. in diameter, globose, fleshy, edible; stone hard, containing' 1 or 2 seeds externally wrinkled.

Distribution: Throughout India ascending to 5,000 ft. The Ber thrives in the drier parts of the country. It is also found in Afghanistan, Ceylon, China, Australia and Africa.

Gardening: Propagated by seed. The Ber frequently becomes a pest, and on this account is undesirable in a garden.

Uses: The tree affords much of the fuel used in dry areas and the thorny branches are used for fencing in agricultural districts. The branches are lopped off for cattle fodder. The wood is also used for saddle trees, agricultural implements, and many other purposes. The fruit forms an article of commerce. Cultivated varieties produce much larger fruit than the wild plants (1 to 1.5 in. long and egg-shaped).

Note: The flowers appear from November till January. Large quantities of the cultivated varieties appear in the markets about January, or later.

26. THE KLEINHOVIA

Kleinhovia hospita Linn. (Order: *Sterculiaceae).*



Kleinhovia is named in honour of a correspondent of Linnaeus, Christian Kleynhoff who was a physician. He kept a garden in Batavia where he grew many medicinal plants. *Hospita* is the feminine *of Hospes,* meaning visitor, guest or stranger. This name is .believed to be used in reference to Kleynhoff on account of his generous disposition,

Description: A moderate-sized tree reached 40 to 50 ft. Leaves 4 to 6 in. by 3 to 5 in., broadly ovate or almost rounded, tip acuminate base heart-shaped *(cordate),* petiole 1 to 4 in. long. Flowers in large panicles at the ends of the branches, small with unequal petals. Fruit a capsule, with a papery coat much resembling the fruit of the Cape-gooseberry. Seeds one in each capsule, roundish.

Distribution: Malaya and East Tropical Africa. Cultivated in some parts of India.

Gardening: Propagated by seed.

Uses: The timber is stated to be of value in Java.

Note: The sprays of flowers appear about the end of July or later, and the fruit remain on the tree for several months.

27. THE SEBESTEN or BHOKAR

Cordia myxa Linn. (Order: *Boraqinaceae)* .

Cordia named in honour of a German botanist of the 16th century, V. Cordus. *Myxa* in Greek means mucous, in allusion to the slime in the. fruit.

Description: A moderate-sized deciduous tree reaching 40 ft. Leaves simple, alternate, 3 to 5 in. long by nearly the same width, leathery in texture and very variable in shape, broadly ovate with entire or cut into margins, tip obtuse, base rounded, cordate, or cuniate. Flowers arranged in terminal or axillary bunches. Calyx cup-shaped with five shallow lobes, corolla of 5 lobes (petals), recurved when open. Fruit a drupe, 0.5 to 1 in. in diameter, rounded or pear-shaped, containing a very stricky pulp in which the seed is embedded.



Distribution: Throughout India, Burma and Ceylon, ascending the Himalayas to 5,000 ft. It also occurs in Egypt, Cochin-China, and tropical Australia.

Gardening: Propagated from seed. Growth is rapid.

Uses: The bark is made into ropes and the fibre is used for caulking boats. The fruit is eaten ripe or pickled. The wood is moderately hard and is used for boat-building, well-curbs, gun-stocks and agricultural implements. Medicinally the fruit is used for simple coughs and as a laxative. The kernels are a good remedy for ringworm. The bark and the unripe fruit are administered as a tonic.

Note: The flowers open in the evening (at about 8 p.m.) and fade the next day. The petals are at first white, gradually they pass to creamy and finally to brown. They are highly scented. The male and female flowers are on separate trees and on this account there are misleading statements in authoritative works. In female flowers the anthers though present are abortive, and in male flowers the style is abortive.

28. GUNDANI

Cordia rothti Roem & Schult. (Order: *Boraginaceae).*

Cordia, in honour of Valerius Cordus a German botanist of sixteenth century. Rothii, also a commemorative name.



Description: A small tree reaching 20-40 ft., bark grey, furrowed. Leaves subopposite, oblanceolate-oblong, rounded at the apex and narrowed into the petiole, 2.5-4 in., rough above, slightly pubescent beneath. Flowers small, white, in loose terminal or axillary, stalked cymes; calyx obconic, minutely pubescent outside, with shining, silky hairs within, lobes small; corolla tubular, with four lobes as long as the tube, oblong, obtuse, reflexed; filaments glabrous. Fruit a drupe, one-seeded, ovoid, mucronate, 0.38 – 0.5 in., yellow or orange-red when ripe, with a gelatinous, pellucid edible pulp.

Distribution: India Punjab, Western Peninsula, Ceylon, Arabia and Abyssinia.

Gardening: Not usually cultivated. Propagated by seed. It is a handsome little tree when in fruit.

Uses: The bark possesses astringent properties and is used as a gargle. The fruit is eaten by the poorer classes and is also pickled. The wood is tough and is used for agricultural implements and as fuel. The bark yields a strong fibre which is made into ropes.

29. PILU or MUSTARD TREE

Salvadora persica Linn. (Order: *Salvadoraceae.)*

Salvadora the origin is uncertain. *Persica* means pertaining to Persia.

Description: A large, much branched, evergreen shrub or small tree; branches numerous, drooping, shining. Leaves somewhat fleshy, elliptic-lanceolate, ovate glabrous, 1.5-2.5 in. by 0.75-1.5 in., tip obtuse, often mucronate, base narrowed, occasionally rounded. Flowers small, greenish yellow in axillary and terminal open panicles, 2-5 in. long, many in upper axils, shortly stalked; calyx minute, cupped, slit halfway down, lobes 4, rounded; corolla cupped thin, 4-lobed, deeply cleft, reflexed, persistent; stamens 4, short, protruding. Fruit a small drupe, 0.125 in. in diameter, round, smooth, pink, red or purple, pungent to the taste. Seeds minute rounded.



Distribution: Drier parts of India and in salt marshes and saline land, often planted near tombs; Ceylon; dry regions of Western Asia, Egypt and Abyssinia.

Gardening: Propagated by seed. Not usually grown in gardens.

Uses: The leaves are eaten as a salad. The root bark is very acrid and is used for blistering, 'The fruit is used in medicine. It forms an excellent fodder for camels.

Note: This is believed to be the Mustard Tree of the Scriptures, The peculiar pungent taste of the leaves and fruit is similar to that of some of the *Cruciferae.* The camel and the White-cheeked Bulbul *(Molpastes leucotis)* are associated with the distribution of the Pilu, and are probably the dispersal agents.

30. SAG or SAGWAN: TEAK

Tectona grandis Linn. (Order: *Verbenaceae).*

Tectona is derived from the vernacular name *Tekka* used in Malabar. *Grandis* in allusion to its beauty or great utility.



Description: A large deciduous tree; branchlets quadrangular, hoary with stelate hairs. Leaves opposite, elliptical or obovate, 12-24 in. by 6-12 in., often much larger in young plants; upper surface or smooth, below hoary; main veins 8-10 pairs, prominent. Flowers small, shortly stalked, in large erect panicles 1-3 ft. long; calyx minute, stellately hairy, enlarging in fruit to about one inch, inflated, wrinkled and net-veined; corolla about 0.25 in. across, 5 or 6 lobed; stamens 5 extending beyond the corolla. Fruit almost round more or less distinctly 4-lobed, 0.25 in. across, felted, soft with a hard seed coat.

Distribution: Western India, Central and Southern India. Burma, Malaya Peninsula, Sumatra and Java.

Gardening: Teak is not a garden plant, but is a very important source of valuable timber and its growing and management is in the hands of the Forest Department.

Uses: The high quality of the timber is of great economic value. It is used for ship-building and all manner of building and furniture making. It is very durable and easily worked and takes a good polish. The utility of this fine timber is too well-known and there is a vast literature centred around it.

31. STAR APPLE

Chrysophyllum cainito Linn. (Order: *Guttiferae).*

Chrysophyllum from the Greek words meaning golden leaf, in allusion to the colouring of the underside of the leaves. *Cainito* derivation uncertain.



Description: A moderate-sized evergreen tree reaching 50 ft. with a dense crown. Leaves 3-4.5 in. long by 2-2.5 in. wide, oval or oblong with a silky-golden underside. Flowers small in cluster in the axils of the leaves. Fruit from 2 to 2.5 in. in diameter, round, smooth, firm. A cross section shows the star-like core, from which the popular name has been derived.

Distribution: West Indies, Panama, and Central America. Often cultivated in towns as a roadside tree, in India.

Gardening: Propagated by seed and sometimes from cuttings made from well-ripened shoots. The soil most suited for its growth is of a sandy character. For fruiting specimens the soil should be well manured to obtain good results.

Uses: Grown for its fruit. When the fruit is allowed to ripen on the tree the pulp is delicious and is eaten uncooked. The colour of the fruit varies from white to purple.

Note: The flowers appear about July-August. The russet colour of the branches and the underside of the leaves easily distinguish this tree.

32. KADVA SIRIS

Hymenodietyon obovatom Wall. (Order: *Rubiaceae)*

Hymenodictyon in reference to the net veined character of the bract. *Obovatum* in allusion to the ovate shape of the leaves.



Description: A large deciduous tree reaching 50 ft. Leaves 4-6 in. by 0.75-3 in., elliptic or obovate, abruptly acuminate, glabrous above more or less pubescent beneath, 6-8 pairs of main nerves, long petioled. Flowers small, inconspicuous, creamy sessile, densely crowded along the rachis, inflorescence panicle. Stamens 5, ovary 2-celled; stigma fusiform. Capsule many seeded, 0.5 in. long, ellipsoid, ovate, short erect pedicels.

Distribution: India, Western Peninsula, a fairly common tree in the Western Ghats.

Gardening: Not usually cultivated. Propagated by seed.

Uses: The bark yield a bitter extract used in Indian medicine as a febrifuge. The wood is employed for making agricultural instruments, scabbards, etc.

Note: A characteristic of the tree is the large leaf-like bract below the inflorescence which is creamy white or pale green when fresh, but dries hard and papery and remains erect and rattles in the breeze long after the leaves have fallen.

33. MANGO or AMB

Mangifera indica Linn. (Order: *Anacardiaceae).*

Mangifera is derived from the combination of two words, *mango* and *fero,* meaning to bare mangoes, from Latin. *Indica* meaning pertaining to India.

Description: A large spreading evergreen tree with dark green leathery foliage. Leaves crowded at the ends of the branches, 5 to 10 in. long by 1 to 3 in. wide, oblong or lanceolate, tip acute or acuminate, base narrowed into the petiole. Flowers in large bunches at the ends of the branches, small, disagreeable in odour. Fruit a drupe, large, fleshy, obliquely pear-shaped or somewhat compressed.



Distribution: Common throughout the greater parts of India, Burma and Ceylon, both hi the wild and cultivated state.

Gardening: Propagated by seed and by grafts. The seedlings should be transplanted during the rains.

Uses: The mango is one of the best known fruits of India. There are several varieties of the fruit and each variety is known by a special name. The timber is rather soft, rough-grained and not durable. It is only used for rough purposes.

Note: The cultivated trees do not attain the magnificent size of the wild ones. The wild fruits are of little value, except, perhaps, for pickle when they are tender. The trees attract various fruit bats when in flower, which come for the sake of the copious exudation of nectar. The bats probably play an important part in the fertilization of the flowers. Besides the bats, there are numerous small insects which creep about the flowers and probably assist in pollination also. The flowers open at dusk and are highly scented.

34. SAPODILLA PLUM or CHIKU

Achras sapota Linn. (Order: *Sapotaceae).*

Both the generic names *Achras,* and the specific name, *Sapota,* are drived from S. American names.



Description: An evergreen tree attaining a height of 50 to 60 ft, with a rounded or conical crown and horizontal or spreading branches. Leaves 3 to 4 in. by 0.75 to 1 in. wide, stiff, shining, tip blunt or acute, base narrowed into the petiole. Flowers small, one to two in the axil of the leaves, drooping. Fruit a drupe, 1 to 2.5 in. long, egg-shaped, with a rough dry skin much resembling a potato in appearance. Seeds 3 to 5, black and shining.

Distribution: A native of the West Indies introduced into India from America. Cultivated throughout the greater part of India for its fruit.

Gardening: The Chiku is largely cultivated in many parts of India for its fruit. It may be grown from seed or from cutting. Grafting is the usual method adopted to obtain the best results. The trees should be protected during the fruiting period by nets from the ravages by fruit-bats. Bats do a considerable amount of damage to the crop.

Uses: The coagulated resinous latex, chicle gum, is used in the United States of America for chewing gum, statuettes, etc.

35. JAMBHOOL

Eugenia jambolana Lamk. (Order: *Myrtaceae).*

Eugenia named in honour of Prince Eugene of Savoy of the 17th century, a patron of Botany. *Jambolana* the Portuguese name of the tree used by Rumphius (1627-1702).



Description: A large evergreen tree with a dense shady crown of shining dark-green foliage, often reaching 80 ft. or more. Leaves leathery, 2.5 to 7 in. long by 1 to 1.5 in. wide, very variable in shape from broadly ovate to elliptical, or lanceshaped, tip blunt, acute or acuminate, base narrowed into the petiole, petiole 0.5 to 1 in. long. Flowers small, crowded in short racemes, creamy white, fragrant, peduncles arising below the leaves (rarely in the axils of the leaves). Fruit egg-shaped or elliptic, crowned with the remains of the calyx, turning deep purple when -ripe.

Distribution: Common throughout India; Ceylon, Burma, Malaya, Australia.

Gardening: Propagated by seed.

Uses: The fruit is used in the preparation of wine and in the manufacture of vinegar. The seeds are said to be useful in the treatment of diabetes. The timber is fairly durable and is used in building, for agricultural implements, and for well work, as it resists the action of water. It gives a good fuel.

Note: The Jambhool is one of the trees held in veneration by the Buddhists, and is often planted near Hindu temples because regarded as sacred to Krishna. The flowering and fruiting varies with the locality, but the general time for the fruit is towards the beginning of the rains. The fallen fruit attract a large number of 'blue-bottle' flies and butterflies during the day and months at night. The fruits are also eaten by jackals and civets.

36. MULSARI

Mimusops elengi Linn. (Order: *Sapotaceae),*

Mimusops is derived from Greek meaning ape-like but the allusion is not clear. *Elengi* is derived from the Tamil name.



Description: A large evergreen tree with a dense crown of dark green, shining foliage, 40 to 60 ft. high. Leaves 2 to 6 in. by 1.5 to 2 in., elliptic, tip shortly accumulate, base acute or rounded, petioles 0.5 to 1 in. long. Flowers star-shaped, fragrant, nearly 1 in. across, 1 to 6 together in the same leaf axil, usually turned downwards. Stamens 8, opposite the inner circle of petals. Fruit 1 in. long, egg-shaped, turning orange when ripe.

Distribution: Indian Peninsula along the Western Ghats from Bombay southwards, and on the east from the Northern Circars southward, the Andamans and Burma, in Mataban and Tenasserim, Ceylon.

Gardening: The Mulsari is often planted as a shade tree and for the fragrance of its flowers. It is propagated from seed and is slow growing.

Uses: The tree yields the pogoda gum of Madras. The bark is used either by itself or in combination with other barks as a dye. The flowers contain a volatile oil from which sweet-scented water is distilled. Oil is also obtained from the seeds. A mouth-wash and a gargle are prepared from the flowers and also from the fruits. The fruit when ripe is eaten. It contains a small quantity of sweet pulp. A preserve is also prepared from the fruit. The oil from the seeds is used for cooking. The wood is good, and is used in building and for carts and cabinet work.

Note: The trees flower sporadically from July to December, but the general period appears to be about November to December.

37. DARBELA

Wrightia tomentosa Roem. & Schult. (Order: *Apocynaceae).*



Wrightia from the name Wright in honour of Wright. *Tomentosa* means softly hairy in allusion to texture of the leaves.

Description: A small deciduous tree reaching a height of 25 to 30 ft. Leaves opposite, variable, 3 to 6 in. by 1 to 3 in., elliptic-lanceolate or oblong-lanceolate, acuminate at the tip, base acute or somewhat rounded, velvety hairy on both surfaces. Flowers in short bunches at the ends of the branches, ill smelling, 1 in. across, white at first turning yellow soon after plucking. Petals 5. Fruit a follicle 6 to 14 in. long, cylindric, with a grove on each side at the junction of the carpels, rough with small tubercles. Seeds 0.5 to 0.67 in. long, slender with a parachute of silk threads to make it suitable for wind dispersal.

Distribution: This tree occurs throughout the greater part of India and in various parts of Burma. It ascends the Himalayas to a height of 4,000 ft. It also occurs in Ceylon and Penang.

Gardening: Propagated by seed. The seeds should be sown about March or April.

Uses: On wounding, every part of the tree exudes a yellow juice which when diluted with water yields a good yellow dye. The seeds are said to contain an oil of medicinal value. The leaves are eaten as a pot-herb by the Santals. The wood is even-grained and easy to work: it is used for making combs, in carving, and turnery, etc.

Note: This tree flowers during the rains. The follicles are united along their whole length and thus appear as a single one, when the fruit is ripe the two follicles separate and later each follicle opens separately to allow the seeds to disperse. The seeds are dispersed by the wind.

38. ARJUNA

Terminalia arjuna Bedd. (Order: *Combretaceae).*



Terminalia a reference to flowers appearing at the ends of the branches. *Arjuna* derived from one of the vernacular names for the tree.

Description: A large deciduous tree with thick, often buttressed trunk and smooth whitish bark. Leaves mostly sub-opposite, 4-8 in. by l.75 – 2.75 in., and smooth whitish bark. Leaves mostly sub-opposite, 4-8 in. by l.75-2.75 in., oblong or ovate oblong, blunt or slightly pointed at the tip, often crenulate, base rounded or cordate or occasionally unequally sided; petiole 0.5 in. with two prominent glands at the top, under the blade. Flowers sessile, in short axillary spikes or in small panicles. Calyx cup-shaped, glabrous, 5-toothed. Ovary glabrous. Disc densely hairy with yellowish hairs, no petals; stamens 10 on the calyx lobes. Fruit with 5 leathery wings, 1.5-2.5 in. across and tan-coloured when dry.

Distribution: Bengal, Burma, Central and Southern India and Ceylon.

Gardening: Propagated by seed. Although not a garden tree it is frequently planted as a roadside tree.

Uses: The wood is used in the construction of carts, agricultural implements and boat building. It is also used for support in mines. It yields a brown transparent gum used as a drug in North India. The Bark is employed in medicine as a tonic and also for dyeing and tanning.

39. BENGAL ALMOND or BADAM

Terminalia catappa Linn. (Order: *Combretaceae),*



Terminalia is in allusion to the leaves being borne at the ends of the branches. *Catappa* derivation uncertain probably derived from a native name.

Description: A tall deciduous tree attaining a height of 80 ft. with horizontal branches arising in whorls 3 to 6 ft. apart. Leaves 5 to 12 in. long by 3 to 6 in. wide, obovate, tip rounded or somewhat acute, base narrowed, somewhat eared (auricled), leathery in texture; petiole bare an inch long. Flowers small, arranged in spikes 6 to 8 in. long, arising in the axils of the leaves. Fruit broadly oval in outline, elliptical and two-winged in transverse section, 1.5 to 2 in. long.

Distribution: The Bengal Almond is a native of the Moluccas and is frequently cultivated in India. It is also native to the Andaman Islands.

Gardening: Propagated by seed.

Uses: The tree yields a gum. The bark and leaves are astringent and yield tannin. The kernel of the fruit yields valuable oil much like almond oil in flavour, odour and specific gravity. Medicinally the kernels, oil, bark and the young leaves are used.

Note: The Bengal Almond sheds its leaves during the cold season, but before falling the leaves turn a brilliant red when the tree forms a striking note in the landscape. The flowers appear in July and August, and also together with the new leaves. This tree must not be confused with the true almond, which is a member of the peach family.

40. MARKING NUT or BIBBA

Semecarpus anacardium Linn. (Order: *Anacardiaceae).*



Semecarpus derived from two Greek words meaning *mark* and *fruit* in allusion to the marking-nut, *Anacardium* is derived from Latin in allusion to the heart-shaped character of the nut.

Description: A moderate-sized deciduous tree with large stiff leaves. Leaves 7 to 24 in, long by 2 to 12 in. wide, obovate-oblong, rounded at the apex (tip), base rounded, cordate or narrowed into the petiole, leathery in texture, main nerves 15 to 25 pairs. Flowers small in panicles, which are shorter than the leaves. Fruit a drupe 1 in. long, ovoid or oblong, smooth and shining, black when ripe, seated on a fleshy receptacle.

Distribution: India, Eastern Archipelago, N. Australia.

Gardening: Propagated by seed.

Uses: The stem yields, by tapping, an acrid, viscid juice from which a varnish is prepared. The nut yields a powerful and bitter astringent principle used everywhere in India as a substitute for marking ink—hence it is frequently called the Dhobi Nut. It gives a black colour to cotton fabrics, but before application it must be mixed with limewater as a mordant. The fruits are also used as a dye. They are also largely employed in Indian medicine. The fleshy cups on which the nuts rest and the kernels of the nuts are eaten.

Note: The flowers appear about the end of the rains,

41. RANJANA

Mimusops hexandra Roxburgh. (Order: *Sapotaceae),*



Mimusops in Greek meaning ape-like. *Hexandra* in allusion to the six stamens.

Description: A large evergreen tree with stiff branches and stiff leaves, reaching 50 to 60 ft. high. Leaves stiff and leathery, 2 to 5.5in. long by 1 to 2 in. broad, obovate of oblong, usually rounded at the tip and narrowing into the petiole. Flowers star-like, solitary or 2-6 together in the axil of the leaf. Stamens 6. Fruit f to 1 in., elliptical or egg-shaped.

Distribution: The dry forests of the Konkan, Deccan, Circars, Orissa and the Carnatic, extending north to the Panchmari Hills and west to Khandesh and the Gujarat.

Gardening: Propagated by seed and is slow growing.

Uses: The tree yields a gum. The seeds yield an oil and is used (in Baroda) to adulterate *ghee.* The wood is very hard and is used for sugar-mill beams, oil-presses, house-posts, etc. The wood is recommended by Brandis for turning.

Note: The fruit when ripe turns yellow and is then eaten by the local people. The flowers are strung together to form necklaces.

42. CASHEW or KAJU

Anacardium occidentale Linn. (Older: *Anacardiaceae).*



Anacardium in reference to the heart-shaped character of the nut; *occidentale,* originating from the west, in reference to its importation from America.

Description: A small semi-deciduous tree. Leaves 4 to 6 in. long by 2 to 3 in. wide, leathery, obovate, or elliptic, rounded at the tip and narrowed into the base *(cuniate).* Flowers in panicles at the ends of the branches, small. Petals 5, bent backwards, linear-lanceolate. Sepals 5. Fruit a kidney-shaped nut borne on the enlarged colourful peduncle; peduncle somewhat broadly conical, 2 to 3 in. by 1.5 to 2 in. broad.

Distribution: A native of Tropical America much cultivated in India, especially along the coast.

Gardening: It is best propagated by sowing.

Uses: The timber is used for boat-building and for other purposes but it is chiefly cultivated for the sake of its nuts. The succulent pedicel is sold in bazaars. Potent liquor is made from the 'fruit'.

Note: The Cashew begins to flower about the middle of December and continues late into January or early February. The fruits appear in the market about March or April. Bats attack the ripening 'fruits'.

43. THE PIPAL

Ficus religiosa Linn. (Order: *Urticaceae).*



Ficus is the Latin for fig. *Religiosa* means in Latin pertaining to religion—a name given to the tree on account of it being considered sacred.

Description: A large deciduous tree with a pale stem often appearing fluted on account of the numerous roots which have fused with the stem. Leaves leathery 4 to 8 in. long by 3 to 5 in. wide, somewhat egg-shaped or rounded, tailed at the tip and heart-shaped at the base, or sometimes rounded. The young leaves are frequently pink, change to copper and finally to green. Flowers minute within the receptacle. Fruit a fig.

Distribution: Indigenous in the sub-Himalayas and wild if not indigenous in many other parts of India. It is frequently planted throughout India and Burma.

Gardening: Preferably propagated from seeds as the cuttings do not do so well as in the case of the Banyan. The soil conditions required are the same.

Uses: The bark yields a tenacious milky juice which hardens into a substance resembling Caoutchouc. The bark yields a fibre. It forms a useful tan. When boiled the bark yields a dye of a reddish-fawn colour. In combination with other barks it yields a black dye. Birdlime is prepared from the sap; it also yields a gum.

Note: The Pipal tree is held sacred both by the Hindus and the Buddhist. This fig often starts life on some wall or on the branches of some other tree. In time the powerful roots split the wall or strangle its supporting neighbour. During its early stages it appears almost like a parasite but as it does not derive its sustenance from its support it is termed an *epiphyte.* The seeds are conveyed in the dust by the wind, or in the dung of animals and birds which feed on the fruits.

44. THE BANYAN TREE or BURR

Ficns bengalensis Linn. (Order: *Urticaeeae).*

Ficus is the Latin for fig. *Bengalensis,* pertaining to Bengal.



Description: A very large, spreading, deciduous tree, often reaching 100 ft. or more sending down numerous aerials from its branches to the ground which in time support the branches. Leaves 4 to 8 in. long by 2 to 5 in. broad, egg-shaped, rounded or elliptical, tip blunt, base rounded or somewhat heart-shaped, 3 to 7 nerves arising from the base. Flowers minute within the 'fig' (or receptacle). Fruit a fig *(sycome)* reaching f in. in diameter.

Distribution: The Banyan is widely distributed through the hill forest of India and is widely cultivated.

Gardening: The tree may be propagated from seeds or cuttings. The seeds should be sown as soon as they ripen, preferably in pots in fine mould mixed with powdered brick or charcoal. Large cuttings should be put down at the commencement of the monsoon.

Uses: The juice of the Banyan yields an inferior rubber; it is also converted into birdlime; and is used in medicine being applied externally for pains and bruises and for rheumatism. An infusion of the bark is regarded as a powerful tonic in the treatment of diabetes. The leaves are heated and used as a poultice. The fruit is eaten as a famine fruit. The twigs and leaves make good fodder for cattle. The wood is of little value, but as it is durable under water it is used for well-curbs.

Note: The tree is regarded sacred by the Hindus and plays a great part in connection with their ceremonies. It often starts life in the same way as the Pipal, as an epiphyte,

45. BURALI-WAD or MYSORE FIG

Ficus mysorensis Heyne. (Order: *Urticaceae).*

Ficus, the Latin for fig, *Mysorensis,* pertaining to Mysore.



Description: A large tree, 40-60 ft. high with a shady crown of large leathery leaves; young branches with rusty (or grey) down, turning glabrous with age. Leaves leathery, 3.5-8 in. by 2.5-5 in., ovate or elliptic shortly and abruptly acuminate, glabrous (slightly shining) above, rusty down beneath when young turning finally glabrous; base cordate or rounded; petioles thick 0.75-1.25 in. long. Receptacles (fruit a fig) sessile, in pairs in the axils of the leaves, nearly glabrous when ripe, orange-red, 1-1.25 in. long, ovate.

Distribution: India, Khasia Mountains, Western Peninsula, Ceylon and Burma.

Gardening: The tree may be propagated from seeds or cuttings.

Uses: Nothing specifically known, but the juice may be used in the same way as that of the Banyan *(F. bengalensis.)*

Often planted as an ornamental road-side tree.

46. PHANNAS or JACK-FRUIT TREE

Artocarpus integrifolia Linn. (Order: *Urticaceae).*

Artocarpus, artos means bread in Greek and. *carpos,* fruit, in the same language. *Integrifolia* in allusion to the entire leaves.



Description: A large evergreen tree often exceeding 50-60 ft. Leaves 4-8 in. long, elliptical, or obovate, tip pointed, margins entire, shining above, 7-8 main nerves; petioles £ in. long. Male and female inflorescences on the same tree: males forming small finger-like receptacles along the branches, 3-5 in. long; female (fruit) 12-30 in. by 6-12 in., pendant from a short, stout stalk from the trunk and larger branches. Seeds 1-1.5 in. kidney-shaped, oily, enclosed in a large fleshy aril-like perianth.

Distribution: India, Burma and Ceylon; largely cultivated for its fruit.

Gardening: Propagated by seed and by cuttings. Frequently planted in the neighbourhood of villages, often surviving the village and remaining a monument to one time human occupation.

Uses: The flesh of the fruit, when ripe, is eaten raw. The seeds are roasted or boiled before eating. The foliage is, at times, used as fodder. The bright yellow wood, turning mahogany with age, was at one time extensively used for furniture. The milky sap is used for blistering and as birdlime. A dye is extracted from the wood chips in Burma to colour the garments of Buddhist priests.

47. GULER

Flcus glomerate Roxburgh. (Order: *Urticaceae).*

Ficus is the Latin for fig. *Glomerata* is in allusion to the clustered arrangement of the fruit.



Description: A deciduous tree attaining a height of 50 to 60 ft. Leaves 3-4 in, long by l.5 to 3 in. wide, ovate-oblong or elliptic-lanceolate, tip blunt, base acute or rounded, smooth. Figs pear-shaped 1 to 1.5 in. in diameter, arranged in large or small bunches along the main branches and the trunk, the figs usually contain a thick syrup-like, sweetish fluid, externally they are covered with soft hairs.

Distribution: The Guler occurs throughout India and Ceylon.

Gardening: Propagated by seed.

Uses: The tree produces a viscid gum from the stem which is made into birdlime. It produces an abundance of fruit which are eaten both ripe and unripe and are considered a useful famine food. The fruit is ground to powder and mixed with flour. The leaves are used for fodder. The wood is not durable and is only utilized for rough purposes.

Note: Bunches of figs appear along the stem and along the main branches, from the old wood. The tree is visited by fruit bats during the night and by a large number of birds during the day. The fallen fruit is greedily devoured by both domestic and wild animals. They are also eaten by children and the poorer classes.

The animal visitors and the wind are largely responsible for the dispersal of the seeds.

48. BOKEDA

Ficus hispida Linn. (Order: *Urticaceae).*

Ficus, the Latin for fig. *Hispida* in allusion to the hairy surface of the leaves, figs, and young branches.



Description: A small tree reaching 20 to 30 ft. high with a crown of stiff leathery leaves. Leaves 4 to 12 in. long by 2 to 6 in. wide, oppositely arranged, ovate, oblong, tip acute or suddenly acuminate, base rounded or cordate, the surfaces are like coarse sand-paper to the touch *(hispid).* Figs *(receptacles)* 0.5 to 1 in. across, pear-shaped, ribbed, in pairs in the axils of the leaves or arranged in bunches along the branches, stem, and even along the exposed roots, and sometimes pushing their ways through the soil from deeper roots.

Distribution: The fig is found more or less throughout India and Ceylon.

Gardening: Propagated by seed or root suckers.

Uses: A fibre is prepared from the bark. The fruit seeds and bark possess valuable emetic properties followed by more or less purging. It is also used as_an antiperiodic and as a tonic. The acrid milk is also used medicinally. The wood is of no value.

Note: The fruits appear all along the stem, branches and even along the main roots. It is not a desirable plant in a garden as it spreads rapidly and widely, sending upshoots from the roots.

49. GOLDEN FIG

Ficus benjamina Linn. var. *comosa* Kurz. (Order: *Vrticaceae).*

Ficus, the Latin for fig. *Benjamina* in honour of botanist of that name; *comosa* in allusion to the feathery branches.



Description: A moderate-sized evergreen tree with dense crown of dark green foliage and somewhat drooping branches. Leaves 2-4.5 in. long by 1-1.5 in. wide, somewhat leathery and shining, broadly ovate or elliptic, tip suddenly tapers to a point, base rounded or somewhat acute. Fruit obovate, 0.75 in. across when ripe.

Distribution: The typical species is indigenous to the Malay Peninsula and Archipelago; the variety is common and wild in the eastern (less so in the western) hills of the Indian Peninsula, at the base of the Eastern Himalayas, and in other hilly parts of Assam, Chittagong, and Burma.

Gardening: Planted from seed.

Uses: None known.

Note: The variety is almost indistinguishable in the herbarium and in the field except by the size of the fruit. The fruit when ripe turn golden or blood red. The dark green foliage and the bright orange yellow fruit make a pretty show.

50. BEEFWOOD or CASUARINA

Casuarina equisetifolia Forst. (Order: *-Cosuarinaceae).*

Casuarina is believed to have been derived from Casurius the Cassowary on account of the resemblance of the branches to the feathers of that bird. *Equisetifolia* in allusion to a horse's tail.



Description: A large evergreen tree attaining 100 ft. or more under favourable conditions, with switch-like and needle-like branches in general appearance like a feathery pine. Leaves reduced to minute scales at the joints of the 'needles'. The male and female cones are borne on separate trees. The male cones are developed at the ends of the green needles, but the female cones are produced on older wood. Female cones about 0.75 in, long, almost round or elliptic with blunt points all over its surface.

Distribution: Casuarinas are largely Australian. In India it is indigenous east of the Bay of Bengal from Chittagong southwards, Malaya Archipelago. It is widely grown in many parts of India where it flourishes as well.

Gardening: Propagation by seed. Growth is rapid. The trees do best in a well-drained soil, and require plenty of sunlight.

Uses: The wood is very hard, cracks and splits easily and is therefore useless for working. It is sometimes used for poles and rafters, but is chiefly good for fuel, for which purpose it is excellent. The bark is used as a tanning material and also medicinally as an astringent. A brown dye is also made from it.

51. THE COCONUT or NAREL

Cocos nucifera Linn. (Order: *Paltnae).*

Cocos in Portuguese, means monkey, in allusion to the nut when bared of the outer casing of coir, for then it looks like the head of a monkey. *Nucifera* means bearer of nuts.



Description: Trunk 40 to 60 ft. high with a crown of large feather-like fronds. Leaves (fronds) 6 to 15 ft. long or somewhat more, leaflets 2 to 3 ft. long, linear-lanceolate, leathery, petiole 2 to 5 ft. long, widest at the base with a sacking like tissue attached to the margins. Flowers arising between the leaves, protected by a boat-shaped sheath (spathe) when in bud; male and female flowers mixed in the same inflorescence. Fruit a drupe, 8 to 12 in. long, somewhat 3-cornered *(trigonus),* egg-shaped or rounded. Seed or nut, 2 to 5 in. in diameter, surrounded by a dense protecting layer of coir and an external waterproof skin.

Distribution: The exact home of the Coconut is shrouded in antiquity, although it is supposed to have originated from South America. Today it occurs in every part of the tropics where it flourishes in the greatest luxuriance in the vicinity of the sea.

Gardening: The Coconut is a beautiful palm for a large garden. It grows easily along the coast, but inland it can be cultivated on river banks with good alluvial soil, or on well-drained terrace with made-up soil and abundant water. In planting place the nut on its side. It requires from 3 to 6 months to germinate. Fruit is produced at varying ages from 4 to 12 years.

Uses: To enumerate the uses of the Coconut would occupy many pages, besides, most of the uses are well known. Suffice it to say that every part of the plant is used for some purpose or other, and in some of the islands the people living on them are largely dependent on the Coconut.

52. MOUNTAIN GLORY or ROYAL PALM

Oreodoxa regia Kunth. (Order: *Paltnae).*

Oreodoxa is derived from two Greek words, *oros* meaning mountain, and *doxa,* glory, in allusion to the lofty stature of some of the species. *Regia* is Latin for regal,



Description: Stem reaching 100 to 130 ft. high surmounted by a large feathery crown of drooping leaves. The stem usually displays a distinct thickening towards the middle. Leaves attain a length of 20 ft, divided feather wise *(pinnatisect)* like that of the Coconut, the petiole forms a sheath embracing the upper portion of the stem below the crown for a length of 3 to 4 ft. Flowers appear in bunches just below the leaf-sheaths. When young the flowers are enclosed in a sheath, but as soon as it opens it discloses the ivory-like inflorescence so long hidden within. Fruit a drupe, small, round about 3/8-in. across.

Distribution: The Royal Palm is a native of Cuba, Jamaica, S. Domingo, St. Croix and Panama. It has been frequently cultivated in various parts of India.

Gardening: Propagated by seed. Does well near the sea but cannot stand salt wash.

Note: This palm flowers almost the year round. The long leaf-sheaths below the crown of leaves readily distinguish this plant from most others together with the slightly bulging stem.

53. THE PALMYRA or BRAB PALM or TAR

Borassus flabellifer Linn. (Order: *Palmae).*

Borassus is from the Greek, a name applied to the covering of the fruit. *Flabellifer* from Latin, meaning fan-bearer.



Description: A tall palm with a crown of fan-like fronds, attaining a height of 60 to 80 ft. or more. The trunk *(caudex)* has an average diameter of 12 to 14 in. Leaves when young folded fan-wise *(plicate)* with many free pointed ends, 4 to 5 ft. across, petiole channelled above with hard saw-like teeth on the margins. Male and female flowers are borne on separate trees. The flowers arise between the leaves. The male flowers are borne on thick finger-like processes, while the female flowers appear like small fruit. Fruit a large drupe, 4 to 6 in. in diameter, with an outer leathery covering under which is a layer of fibre surrounding the nuts. Seeds or nuts 1.5 to 2 in. across rounded in outline but flattened, 2 to 3 in each drupe.

Distribution: The Brab is indigenous to India. It is found both wild and cultivated especially in the coastal districts. It was thought to be an introduction til] a few years back.

Gardening: Like many palms the Brab is slow growing and takes several years before it shows a stem above ground. It flowers when it is about 12 to 15 years old.

Uses: Like the Coconut the Brab is put to many uses. The juice or *toddy* is extracted from the inflorescences only. Sugar or *jaggery* is obtained from it. Arak is another product. The leaves are used largely for thatching, mats and all manner of utensils for carrying and storing water, and food. The tender fruits are eaten during the hot season. They look like pieces of translucent ice.

54. BAEL FRUIT or BENGAL QUINCE



Aegle marmelos Corn (Order: *Rutaceae),*

Aegle is the Latin name for one of the three sisters of the Hes-perides who, aided by a dragon, guarded the golden apple belonging to Hera. *Mwmelos* is derived from the Portuguese name 'marmelos de Beggla.'

Description: A small deciduous tree armed with strong straight spines 0.5 to 1.5 in. long. Leaves compound, trifoliate, leaflets lanceolate or elliptic-lanceolate, 1.5 to 4 in. by 0.75 to 2 in., the terminal leaflet only on a long stalk. Calyx 4-lobed, sepals rounded, very minutely hairy. Petals 4, 0.5 in. long, oblong, leathery. Stamens many, 50 or more. Fruit 2 to 5 in. in diameter, rounded; pulp sweet, thick, orange coloured.

Distribution: Wild in the sub-Himalayan tract, central and southern India, and Burma. Frequently planted all over India and Burma.

Gardening: Seeds should be collected from fruits taken off the trees, washed, dried for a few days, and, if necessary, coated with red lead to keep away ants. Should be sown about April or May. The seedling should be transplanted in the second season on account of the slow growth.

Uses: The Bael is one of the most useful and well known of the Indian tree—almost every part of the tree is put to some use. A gum is obtained from the stem. A mucous is obtained chiefly from the fruit which is used as cement when mixed with lime; it is also mixed with water paints as a drier and to give a glossy finish; it is also used as a soap substitute. The fresh ripe fruit is eaten as an article of food. The fruit is made into pickles, *sherbet,* and syrup. The best known preparation is a marmalade made from the fruits and used in cases of diarrhoea and dysentery.

Note: The Bael is sacred to the Hindus; the leaves being specially suited for the worship of Shiva.

55. INDIAN CORAL TREE or PANGARA

Erythrina indica Lam. (Order: *Leguminosae).*

Erythrina is derived from a Greek word meaning red in allusion to the colour of the flowers; *indica* means pertaining to India.



Description: A moderate-sized deciduous tree with prickly stem and branches reaching 50 to 60 ft. in height. Leaves compound, trifoliate: leaflets, 4 to 6 in. long by 3 to 5 in. wide, the terminal leaflet the largest, broadly rhomboid-ovate (somewhat broadly triangular), tip acute or acuminate, base truncate or rhomboidal; petiole 4 to 8 hi. long, with glands at the base of each leaflet. Flowers large 2 to 2.5 in. long, pea-shaped, in dense racemes 4 to 12 in. long, arranged in clusters of 1 to 4 at the ends of the branches; peduncle thick, woody; pedicels short. Calyx somewhat tubular, 5-toothed at the mouth. Corolla, standard petal long upright, keel, wing petals about §rd its length; stamens 10, united into a bundle, and much exceeding the keel petals in length. Fruit a pod, 5 to 14 in. long, somewhat cylindrical or moniliform, constricted between the seeds. Seeds 0.5 to 0.75 in. somewhat kidney-shaped.

Distribution: Coastal forests of India and Burma; the Andamans, Nicobars, Java and Polynesia'a. Much cultivated in India for the sake of the beauty of the flowers.

Gardening: Propagated by seeds and by cuttings. Thick branches often used as supports take readily, thus often killing out the plant propped up. It grows best in the drier soils.

Note: The flowers appear during February, The fruits remain on the tree till the end of the year. The tree is said to have a beneficial influence on the soil owing to the nitrogen-feeding bacteria contained in the tubercules on the roots. On this account the Erythrinas are used as shade trees in cultivation.

56 BARN A

Crataeva nurvala Hamilton, (Order: *Capparidaceae),*

Crataeva in honour of Crataevas, an obscure writer on medicinal plants about the beginning of the first century; *Nurvala* is derived from one of the Indian vernacular names.



Description: A small or moderate-sized deciduous tree reaching a height of 30 to 40 ft. Leaves compound, trifoliate; leaflets 2 to 6 in. long by 0.5 to 2.5 in. wide, ovate-lanceolate or obovate in shape, tip acuminate, base narrowed into the stalk, petiole 2 to 6 in. long. Flowers in dense corymbs at the ends of the branches; peduncle short and stout; pedicels 1 to 2 in. long; sepals small, ovate, tip acute; petals 4, 1 by 0.75 in. (including the claw-like base), ovate, elliptic or obovate, tip rounded, base narrowed into a claw. Stamens 20 to 25, exceeding the petals; the ovary is poised at the end of a long stalk *(gynophore)* as long as the stamens. Fruit a round or egg-shaped, woody, berry at the end of the enlarged and elongated gynophore, 1 to 1.5 in. in diameter, at first green turning scarlet when ripe.

Distribution: Throughout the greater part of India and Burma, wild or cultivated.

Gardening: Propagated by seed. The seeds frequently do not germinate for a considerable time.

Uses: The fruit is mixed with mortar to form strong cement. The rind is used as a mordant in dyeing. The wood is much used. The bark of the stem and roots is much used hi medicine. The fruit and bark are used as an embrocation in rheumatism. The fresh leaves and root bark are rubifacient and vesicant.

Note: The flowers appear at the end of November or in December. An insect gall often attacks the peduncle, which frequently appears like a fruit.

57. MAUVE TABEBUIA

Tabebuia rosea (Order: *Bignorriaceae).*

Tabebuia is derived from the Brazilian name of the tree. *Rosea* in allusion to the rose colouring of the flowers.



Description: A small or medium-sized deciduous tree attaining a height of about 20 to 30 ft. Leaves compound, digitately arranged, leaflets 3 to 6 in. by 1 to 2 in., 3 to 5 in number, the terminal the largest, elliptic-oblong, usually unequal-sided, tip blunt or rounded, base unequal, rounded or slightly cordate. Flowers large, funnel-shaped, arranged in groups of threes on a common peduncle. Calyx somewhat cupped, the margin divided. Corolla 5-lobes wrinkled. Fruit a capsule 5 to 6 in. long, fusiform, terminated by the remains of the style. Seeds flat, winged.

Distribution: A native of Mexico. Cultivated as a roadside tree in India.

Gardening: Propagated by seed.

Uses: None known.

Note: A beautiful tree when in bloom, but leafless or almost so at the time. The flowers open in the morning and fall at night. Though Macmillan, in his *Tropical Gardening and Planting.,* says that it 'rarely bears seed at Peradeniya,' it does so very freely in the neighbourhood of Bombay. The trees are called *evergreen* by Bailey, but this is certainly not the case in India.

58. PALAS or FLAME OF THE FOREST



Butea frondosa Koenig, (Order: *Leguminosae).*

Butea in honour of John Stuart, 3rd Earl of Bute, a patron of botany. *Frondosa* from Latin, signifying 'leafy.'

Description: An erect, deciduous tree reaching 30-40 ft. with a crooked trunk and irregular branches. Bark ash-coloured and rough, young shoots downy. Leaves 3-foliate; leaflets leathery, finely silky below when young, turning glabrous with age, nerves conspicuous; the terminal leaflet is obovate, 4-8 in. long, the lateral leaflets are broader, more rounded or somewhat oblique. Petiole 4-6 in. Flowers large, grouped in dense clusters along the branches; pedicles 1-2.5 in., rich velvety brown; calyx velvety brown externally, silky white within; standard flaming orange internally, externally salmon pink due to the delicate coating of silky white hairs, lateral petals similar to the standard but narrower, the keel petals united to form a 'boat;' stamens 10, 9 united and one free. Pod one seeded, 4-6 in. long by 1-1.5 in. wide, one margin is thickened and the other thin and wrinkled, pale green turning yellowish brown and covered by a silvery white sheen composed of hairs.

Distribution: Common throughout the greater part of India, ascending the outer Himalayas to 3,000 ft. and to 4,000 ft. in the South Indian Hills. It is also in Burma. It is often found gregarious.

Gardening: Propagated by seed. Thrives well in black, cotton soil, in salt lands and in water logged places.

Uses: The various parts of the tree have numerous uses: it is decorative, useful in the recovery of salt lands and for the cultivation of the lack insect. The red gum is used in medicine, tanning and dyeing. Root fibre made into ropes and sandals. Leaves for 'plates' and packing of food. The flowers yield a dye. The tree is somewhat sacred and is mentioned in the Vedas.

59. BAOBAB or GORAK-CHINCH



Adansonia digitate Linn. (Order: *Bombacaceae)*

Adansonia so named in honour of the French botanist Adenson. *Digitata* in allusion to the finger-wise arrangement of the leaflets.

Description: A large deciduous tree with a remarkably large bottle-shaped trunk. Leaves compound, digitately arranged on a common stalk, leaflets 2 to 5 in, long by 1.5 to 2 in. wide obovate-oblong, tip acute or blunt, surface hairy, cannon petiole 6 to 7 in. long, petiolules of the leaflets almost absent. Flowers large, pendent on a long thick peduncle reaching 8 in. long Calyx somewhat fleshy covered with a thick velvety down on the outside, and white silky down on the inside, lobes oblong-lanceolate; petals large, white, with crinkled margins. Stamens arranged on a thick stalk and forming a globular tassel to the flower. Fruit egg-shaped or oblong, woody, packed with a powdery pulp: within, 4 to 12 in. long by 2 to 5 in. wide velvety hairy outside.

Distribution: Tropical Africa. Introduced into India by the early Arab traders.

Gardening: Propagated by seed. Slow growing; thrives well in a sandy soil.

Uses: The wood is soft and spongy. The inner bark fibre is used for rope and cordage in Madagascar and Africa. The pulp surrounding the seeds is agreeably acid and edible.

Note: The flowers appear about the end of May and continue till about the end of July, and open at night and fall by morning. The scent is strong and unpleasant. Bats visit the flowers and are the agents of fertilization. The Baobab is one of the Methuselahs of the Vegetable World, it attains the grand old age of 5,150 years! A Baobab existing at Bijapur is mentioned in Medows Taylor's romance *Tara.*

60. SIMUL or RED SILK COTTON TREE



Gossampinus malabarica Men. (Order: Bombacaceae).

Gossampinus a combination of two Latin words referring lo the tree as the 'Cotton Pine;' malabarica means pertaining to Malabar.

Description: Often a very large deciduous tree, reaching 130 ft. or more in height, with trunk and branches covered with warty spines, buttressed. Leaves compound, digitately arranged, leaflets 3 to 7 in number, 3 to 7 in. long by 1 to 2 in. wide, lanceolate or oval in shape, tip pointed, base acute, common petiole 8 to 9 in. long, petiolules 0.5 to 1 in. Flowers large, crowded at the ends of the branches appearing when the tree is leafless, petals five, elliptic oblong, recurved, 2 to 4 by 0.75 to 1.25 in. wide, fleshy. Calyx thick, cup-shaped, usually 3-lobed. Stamens arranged in five bundles of 9 to 12 and a central bundle of 15 stamens. The style arises from the midst of the central bundle of stamens. Fruit a capsule 4 to 5 in. long by 1 to 1.5 in. broad, filled with long fibres of silky cotton and small round seeds.

Distribution: Throughout India and Burma up to an altitude 3,000 to 5,000 ft.

Gardening: Propagated by seed.

Uses: The tree yields a dark-brown astringent gum used in medicine. The inner bark of the tree yields a good fibre suitable for cordage. The wood is used in the manufacture of matches. The most important product of the tree is the floss used for upholstery and life-belts. Trade name is *Semul.*

Note: A yellow-flowered form exists. The tree is called the *varma-druma*, or tree of the infernal regions or of the god of death, because it makes a great show of flowers and produces no edible fruit. The cut branches exude mucilage in water. The flowers open at night and are visited by fruit bats for the nectar.

*Bombax malabaricum.

61. SIMUL or SILK COTTON TREE



Gossampinus iosigne. (Order: *Bombacaceae).*

Gossampinus a combination of two Latin words referring to the tree as the 'Cotton Pine;' *insigne* means illustrious.

Description: A large deciduous tree very similar and often mistaken for the Red Cotton Tree, with an unarmed or slightly prickly trunk. Leaves compound, digitately arranged on a common petiole 7 to 10 in. long, leaflets 7 to 9 in number. 5 to 6 by 1 to 1.75 in., obovate in shape, tip acuminate, narrowed into the base. Petiolules very short. Calyx urn-shaped, slightly 2-lobed, 1.5 in. long, sometimes prickly outside, densely silky within. Corolla showy, scarlet, pink, creamy, or white, petals 5, narrowed into the base, 3 to 6 in. long by 1-1.5 in. wide, reflexed. Stamens arranged in bundles of 50 or more and completely filling the cup of the corolla. (This is a very good distinguishing character to separate it from the Red Silk Cotton.) Fruit a capsule reaching almost a foot in length by 2 to 2.5 in. in diameter, distinctly five-angled (another good distinguishing character), filled with silky cotton and round seeds.

Distribution: India, Western Ghats southwards; Assam; Burma, the Malay Peninsula and the Andamans; and Cambodia.

Gardening: Propagated by seed.

Uses: The uses are the same as those of *Gossampnus malabarica*

Note: This species is very easily confused with *Gossampinus malabarica,* but the very much greater number of stamens which entirely fill the 'cup' of the flower helps to distinguish the two species. The somewhat angular fruit is a good distinguishing character. The flowers open in the morning 'and are largely visited by insects.

62. WHITE SILK COTTON TREE



Ceiba petandra (Linn). Gaertn. (Order: *Bombacaceae)*

Ceiba a vernacular name. *Pentandra* in Latin means five stamencd.

Description: A tall deciduous tree, trunk prickly when young, branches horizontal, arranged in whorls of threes. Leaves compound, digitately arranged; petiole 4 to 6 in. long; leaflets 5 to 8 in number, lanceolate, 2 to 6 in. long by 1 to 1.5 in, wide, paler in colour beneath, petioles extremely short. Flowers appearing at the same time as the young leaves, crowded at the ends of the branches, hanging downward, 1.5 to 2 in. in diameter. Petals 5, ovate-oblong, tip obtuse, twice the length of the calyx, woolly outside. Stamens 5, in anthers wavy. Fruit a capsule, fusiform in shape, 4 to 5 in. long, blunted at the tip, and filled with silky cotton as in the case of the Red Silk Cotton.

Distribution: Indigenous to the Andamans, the Malay Archipelago, Ceylon, South America. Cultivated in several parts of India.

Gardening: Propagated by seed.

Uses: A medicinal gum is obtained from the tree. The wood is employed as a tanning material. The seeds yield a high proportion of oil much resembling cotton-seed oil. The oil cake is highly beneficial as a cattle food. The wood is poor and of little use. The most useful part of the plant is the floss obtained from the fruits.

Note: The stem is usually smooth and greenish, even in old trees. The flowers appear from December to January. They open at night, emit a powerful odour and secrete a copious amount of nectar. Pollination is largely effected by the nectar-feeding bats.

63. PINARI



Sterculia foetida Linn. (Order: *Sterculiaceae).*

The name *Sterculia* is derived from the old Roman word *stercus* meaning dung. The Romans deified objects of their greatest dislike and most immoral actions. Thus they have the gods Sterculius, Crepitus, and the goddesses Caca and Petunda. The flowers and leaves of some of the species of the genus are evil smelling. *Foetida* means stinking, on account of the foul odour emitted when the trees are in flower.

Description: A large deciduous tree with the branches arranged in whorls and spreading horizontally. Leaves compound, digitate, crowded at the ends of the branches, leaflets 5 to 9 in number, 4 to 7 in. long by 1.5 to 2 in. wide, oblong-lanceolate, tip acute or acuminate, narrowed into the base. Flowers 1 to 1.5 in. in diameter in raceme-like panicles, 4 to 10 in. long, formed immediately under the young leaves. Fruit composed of follicles which may be arranged from 1 to 5 on the pedicel, 4 to 5 in. long by 2 to 3 in. wide, boat-shaped, somewhat beaked at the tip, green at first turning scarlet. Seeds 0.75 in. long, ovoid-oblong, black and shining.

Distribution: East Tropical Africa, the Moluccas, North Australia, Ceylon. The tree is indigenous to western and southern India and Burma, and is sometimes cultivated.

Gardening: Propagated by seed.

Uses: The tree exudes a gum resembling tragacanth. Oil is extracted from the seeds by boiling. In times of scarcity the seeds are roasted and eaten. The flowers and leaves are used medicinally.

Note: The Sterculia flowers from January to March. The fruits remain on till the following monsoon, but the seeds are usually shed in the hot weather.

64. STAR GOOSEBERRY or HARPHARORI



Phyllanthus acidus (Linn,) Skeels. (Order: *Euphorbiaceae).*

Phyllanthus is derived from Greek words meaning *leaf-flower,* an allusion to the apparent bearing of flowers on the leaves; *acidus* on account of the acidity of the fruit.

Description: A small deciduous tree reaching about 25 to 30 ft. Leaves compound, 14 to 25 in. long, crowded at the ends of the branches leaflets 2 to 3.5 in. long by 1 to 1.5 in. wide, alternately arranged along the rachis, ovate or obliquely ovate, acute or somewhat acuminate, rounded or somewhat cuniate. Flowers very minute, in short dense spike-like clusters arising from nodules along the branches (the clusters resemble minute mulberries). Fruit pendulous, in small clusters from the branches, round or slightly flattened at the poles, with shallow or deep ribs (usually 5) 0.75 in. across.

Distribution: A native of Malay Islands and Madagascar and frequently grown in India for its acid fruit

Gardening: Propagated by seed and suited chiefly to the moist low country.

Uses: The fruit is used chiefly for pickling and for the preparation of preserves. It makes an excellent jam,

Note: The tree usually flowers and produces fruit twice a year. The minute male flowers fall very readily. The ovary instead of supporting the usual three stigmas frequently produces additional abortive stigmas on the lobes of the young fruit.

65. THE PADAUK



Pterocarpus indicus Willd. (Order: *Leguminosae).*

Pterocarpus, two Greek words in combination meaning *winged fruit* in allusion to the wing round the seed. *Indicus,* pertaining to India.

Description: A semi-deciduous tree attaining a height of 50 ft. or more with a spreading crown and dark foliage. The branches have a tendency to droop. Leaves 8 to 10 in., imparipinnate, leaflets are alternately arranged along the rachis, 3-4 in. long by 2 to 2.5 in. wide, egg-shaped or robicular, tip acute or notched, base rounded. Flowers arranged in racemes, 1 to 2 in each axil of the leaves. Calyx short, 5-toothed. Petals composed of a wrinkled standard, the remainder form the keel. Fruit a pod 1 to 2 in. diameter. The single seed is in the centre, surrounded by a wrinkled membrane which enables it to parachute when it is detached.

Distribution: The Padauk is believed to be indigenous to the Malay Peninsula and Archipelago, from whence it was introduced into Burma and India.

Gardening: Propagated from seed or by cuttings. Seedlings should be protected from the sun during the heat of the day and should be transplanted in the second season, at the commencement of the rains.

Uses: The tree exudes a gum resembling 'kino' gum. The gum is used medicinally. The wood is moderately hard and is used in the manufacture of furniture. It is not attacked by white-ants.

Note: The tree is a beautiful sight when in full bloom, but the beauty is short-lived as the flowers fall very rapidly and carpet the ground much to the annoyance of the *mali!* The flowers appear about the end of May or early June (Bombay) and the fruit usually fall at the next deciduous period.

66, SAUSAGE TREE



Kigelia pinnata DC (Order: *Bignoniaceae)*.

Kigelia is derived from the native name of the tree. *Pinnata* refers to the pinnate formation of the leaves.

Description: A moderate-sized evergreen tree growing to a height of 20 to 50 ft. with a spreading crown. Leaves compound, imparipinnate, leaflets 3 to 4 pairs with an odd one, 3 to 6 in. long, elliptic-oblong or obovate, stiff and leathery. Flowers large, ill-smelling on long pendant peduncles. Calyx cup-shaped with somewhat acute lobes. Corolla deep, 5-lobed, funnel-shaped, the lobes much wrinkled and turned backwards a little. Fruit gourd-like, 1 to 3 ft. long by 3 to 5 in. in diameter, solid fibrous within, hanging like great big sausages from the branches.

Distribution: The Sausage Tree is a native of the Mozambique district of Africa. Often cultivated in India as a roadside tree.

Gardening: Propagated by seed.

Uses: The fruit when cut and slightly roasted is said to be used as an outward application in certain diseases.

Note: In parts of Africa the Sausage Tree, or possibly a related species, is considered sacred.

The flowers open at night and fall by 9 or 10 a.m. in the morning. They have a strong odour and are visited by the smaller fruit bats which are undoubtedly the pollinating agents.

67. SYRINGE TREE or FOUNTAIN TREE



Spathodea campanulata Beauv (Order: *Bignoniaceae)*.

Spathodea derived from Greek, meaning spathe, in allusion to the spathe-like calyx. *Companulata* in allusion to the cup or bell shape of the corolla.

Description: An handsome evergreen or deciduous (in dry areas) tree reaching 70 ft. Leaves imparipinnate, large; leaflets opposite with one terminal, 9-19, smooth, elliptical or oval, abruptly pointed, 3-4 in. long. Shoots velvety, the young leaves somewhat hairy below. Flowers in large, globular clusters at the end of the branches. Calyx large and boat-shaped, recurved. Corolla is a wide open bell 4 in. long with five (or six) somewhat triangular, reflexed lobes, margins wrinkled. Stamens 4, protruding from the cup; style as long as the stamens. Fruit a smooth, woody, oblong-lanceolate capsule pointed at both ends. Seeds elliptical, winged.

Distribution: Tropical Africa. Introduced into Ceylon in 1873. Its introduction into India is not recorded.

Gardening: Propagated from seed, root suckers, which appear freely, or by cuttings. It thrives well up to 4,000 ft. and in districts where the rainfall is not too high.

Uses: Useful for shade and makes fine avenues. A decoction from the dried centres of the fruit is poisonous and is used by hunters to procure meat. Wood white and very soft; it is suitable for carpentry work and perhaps paper making.

Note: The large buds are full of water and when pressed squirt a jet of liquid, hence the popular names.

68. KARANJ

Pongamia glabra Vent. (Order: *Leguminosae),*

Pongamia is derived from the Tamil name for the tree *ponga* or *pongam. Glabra* is the Latin for smooth in reference to the leaves.



Description: A moderate-sized deciduous tree reaching 40 to 60 ft. high. Leaves compound, imparipinnate, 5 to 10 in. long, leaflets opposite with an odd one, 2.5 to 5 in. long by 1.5 to 3 in. wide, somewhat egg-shaped or elliptic, acute or sometimes acuminate at the tip, base acute or rounded. Flowers in short racemes in the axils of the leaves, which are shorter than the leaves. Calyx small, cup-shaped. Corolla 0.5 in. long standard rounded, the remainder of the petals forming a keel. Fruit a pod 1.5 to 2 in. long by 0.75 to 1 in. broad, 1 to 2-seeded (usually 1).

Distribution: Throughout the greater part of India and Burma chiefly along the beds of streams; common also along the coast in beach and tidal forests; Andamans, Tropical Asia generally, and the Seychelles. Commonly planted as a roadside tree.

Gardening: The Karanj is easily raised from seed. The seeds may be first sown in pots and transferred to the ground at the commencement of the monsoon. It is a very hardy tree and can adapt itself to varying conditions.

Uses: The seeds yield thick reddish oil used for burning and for skin diseases.

Note: The flowers and new leaves generally appear together. The leaf shedding is very irregular in the species depending possibly on situation, age, or even in the individual. When the trees are in flower the ground below them is usually carpeted with blooms. The fruit remains on the trees till the next lot of new leaves appear.

69. ASOKA

Saraca indica Linn. (Order: *Leguminosae).*

Saraca, the origin of the generic name is obscure. *Indica,* pertaining to India.



Description: A small evergreen tree 20-30 ft. with spreading branches and a dense crown of leaves. Leaves alternate, pari-pinnate, about one foot long; leaflets 3-7 pairs, opposite, 5-7 in. long, lanceolate, glossy above, young leaves drooping, red and flaccid. Flowers in dense clusters springing from the older branches and the trunk, yellow, turning red with age; corolla tubular; petals 4, ovate, a fleshy ring on the summit of the corolla tube carries 4-7 long, spreading filaments, each bearing small kidney-shaped anthers. The style is nearly as long as the filaments. The pod is 6-10 in. by 1.5-2 inch pink or rosy when young, turning green and finally brown when dry. Seeds 4-8, smooth, grey, 1-1.5 in. long.

Distribution: Commonly found wild along streams or in the shade of evergreen forests in India, Burma, Ceylon and .in the Malayan region.

Gardening: Propagated by seed. It does well in most gardens and when in flower is very attractive.

Uses: The Asoka is sacred to Hindus and Buddhists alike and numerous legends and uses are attributed to this beautiful tree. It often marks the site of temples and rock carvings. A decoction of the bark is used in uterine affections, especially, monorrhagia. It is also used as an astringent in cases of internal haemorrhoids. The pounded flowers, mixed in water, are used in dysentery.

70. GLIRICIDIA

Gliricidia sepium Jacq. (Order: *Leguminosae).*



Gliricidia means ‘rat destroyer.’ The seeds are believed to be an effective rat poison. *Sepium* from Latin *Sepes,* a hedge, in allusion to its use as a hedge plant.

Description: A small tree reaching 30-40 ft. Leaves impari-pinnate; leaflets 4-8 pairs, opposite with a terminal one, oblong or oblong-lanceolate, narrowed into the base and the tip, 1.5-2.5 in. long. Flowers pink or pinkish purple, in short racemes arising in the axils of the leaves; calyx somewhat cup-shaped, obtusely 5-toothed; corolla composed of a large standard, two sickle-shaped lateral petals and an incurved keel petal. Pods 4-7 in. long by 0.75 in. broad, seed flat, 0.3 – 0.5in. across.

Distribution: Guatemala to southern America, Introduced into Ceylon in 1899 from the West Indies and subsequently into India.

Gardening: Propagated by seed or by cuttings of few feet long and planted 12 or more feet apart. Gliricidia is fast growing. The wood is very brittle, breaking easily in heavy wind. The trees do better when pollarded at intervals.

Uses: Used frequently as a shade tree in cocoa plantations.

71. WOOD APPLE or KAVATH

Feronia limonia Linn. (Order: *Rutaceae),.*

Feronia is the name of the Roman goddess of forests, and the tree has been named in her honour. *Limonia* in allusion to its lemon-like fruit.



Description: A moderate-sized tree with sharp prickles. Leaves compound, imparipinnate, petiole and rachis flat, often narrowly winged leaflets 3 to 9, opposite, 1 to 1.5 in. long by 0.5 to 1 in. wide, obovate, tip often crenulate, base cuniate. Flowers small, numerous. Calyx 5 to 6 lobed, lobes triangular, petals 5 to 6 in., spreading or bent downwards. Stamens 10 to 12. Fruit round, hard, 2 to 3 in. in diameter. Seeds embedded in an edible pulp.

Distribution: Java and Ceylon. Often cultivated throughout India.

Gardening: Propagated by seed.

Uses: A limited proportion of gum issues from the tree. The gum is said to be useful in the preparation of water colours, and to be preferred to Gum Arabic. Oil is said to be obtained from the leaves and the seeds. The fruit is eaten either ripe or when raw it is variously prepared with spices. A jelly is prepared from the ripe fruit which has an astringent taste. The wood which is hard and durable is used for various purposes. The hard dry shells of small fruits are made into snuff boxes. The fruit is largely used medicinally as a remedy for diarrhoea, dysentery, and other stomach disorders. The bark and gum are also employed in much the same way, but to a lesser degree.

72. BILIMBI or CUCUMBER TREE



Averrhoa bilimbi Linn. (Oixter: *Oxalidaceae).*

Averrhoa in honour of an Arabian physician Averrhoes. *Bilimbi* is derived from the native name.

Description: A small tree 15 to 60 ft. with the leaves crowded at the ends of the branches. Leaves compound, 18 to 24 in., leaflets 11 to 35 in number, opposite or nearly so with an odd one at the top *(imparipinnate)* 1.5 to 3 in. by 0.75 to 1 in., oblong, or oblong-lanceolate, tip acute or acuminate, base rounded, somewhat oblique, short. Flowers arising from the trunk and branches in short softly hairy panicles; sepals 5; petals 5. Stamens, five with anthers. Fruit oblong with rounded angles, 3 to 4 in. long.

Distribution: Tropical Asia. The origin is uncertain. It is often cultivated for the sake of its edible fruit.

Gardening: Propagated by seed.

Uses: Much the same as those of the Carambola, No. 57.

Note: When not hi fruit this tree may quite easily be mistaken for the Star Gooseberry, No. 52—the leaves appear similar at first glance, but in the former the leaflets are nearly opposite, while in the latter the leaflets are very distinctly alternately arranged.

73. CARAMBOLA or KAMRUK



Averrhoa carambola Linn. (Order: *Oxalidaceae).*

Averrhoa, in honour of an Arabian physician, Averrhoes; *Carambola* is the Malayan name,

Description: A small tree reaching about 25 ft. Leaves compound, imparipinnate, about a foot long, leaflets 5 to 11 alternately arranged along the rachis, 1.5 to 2.5 by 0.75 to 1.5 in., ovate or ovate-oblong, tip acuminate, base rounded, oblique, or cuniate (especially the terminal leaflet). Flowers in short axillary racemes, or arising from the old wood, small; sepals 5, petals 5, Stamens 10, five of which are without anthers. Fruit oblong, acutely 5-angled, turning yellow when ripe, 3 to 5 in. long.

Distribution: Tropical Asia. Like the Bilimbi, the Kamruk has been long in cultivation and its home is buried in antiquity. Widely cultivated for the sake of its edible fruit.

Gardening: Usually propagated by seed, but the good varieties are best obtained by budding *(gootee).*

Uses: The leaves, roots, and fruits have antiscorbutic properties and are used as cooling medicines. The fruit is used for making jelly preserves, pickles, etc., and a pleasant drink is made from it. The unripe fruit is astringent and is used as an acid in dyeing and for removing iron mould and other stains on linen. It is also used for burnishing brass. The unripe fruits are also eaten in curries. The timber is used in the Sunderbunds for building and for furniture.

74. SOHAGA

Amoora rohituka Wight & Arnott. (Order: *Meliaceae).*



Amoora is derived from the Bengali name of the species *Amoor; Rohituka* is probably derived from one of its many vernacular names.

Description: An evergreen tree reaching about 60 ft. Leaves compound, imparipinnate, 1 to 2.5 ft. long, leaflets opposite, 4 to 8 pairs and an odd one, 3 to 9 in. long by 1.5 to 4 in. wide, elliptic oblong or oblong-lanceolate, the two halves of the blade rather unequally sided *(inequilateral),* tip acuminate, base obtuse or acute, the surface smooth and somewhat shining. Flowers small, arranged on a stiff stalk forming a spike in the axils of the leaves, the petals are 3, the stamens are hidden inside an urn-shaped structure called the staminal-tube which has a small opening at the top. Fruit 1-1.5 inches globular or egg-shaped, 3-vaIved, turning yellow when ripe. Seeds oblong with a scarlet aril.

Distribution: India, Western Peninsula, Oudh, and Assam; Burma; Malaya; Ceylon and the Philippines. Often planted.

Gardening: A tree of moist shady localities. Propagated by seed. The seedling should be planted in shade.

Uses: None known.

Note: The fruit when ripe splits exposing the deep orange-coloured seeds which appear beautiful against the deep green foliage.

75. NEEM

Azadirachta indica A. Juss. (Order: *Meliaceae).*



Azadrachta is derived from the Persian name *Azad-dazakht,* the name given to the Persian Lilac, *Melm azadirach,* to which the Neem is allied. *Indica* means pertaining to India.

Description: A comparatively large deciduous tree attaining a height of 40 to 50 ft. Leaves compound, simply imparipinnate, 8 to 15 in. long, crowded at the ends of the branches; leaflets 1 to 4 in. long by 0.5 to 1.5 in. wide, obliquely lanceolate or occasionally falcate, tip acute or acuminate, base unequally sided, margins serrate. Flowers small, sweet-scented, in panicles in the axils of the leaves. Sepals 5. Petals 5. Fruit a one-seeded drupe elliptic in shape.

Distribution: India, but the exact location of the plant is somewhat doubtful. It is to be found throughout the drier parts of the country, and also in the dry zone of Burma.

Gardening: Propagated by seed. The seeds should be sown soon after the fruit has ripened. Growth is comparatively slow.

Uses: The tree yields a clear amber-coloured gum used medicinally. The seeds yield an acrid, bitter oil of a deep yellow colour and disagreeable flavour. It is used as an anthehninthic and antiseptic, and is much in demand. It is also used in the manufacture of soap and for burning, but it smokes badly. The oil is used as a cure for mange in dogs, both internally and externally. The wood is durable and is used for various purposes. The green twigs are used for cleaning the teeth. The ripe berries are recommended in cases of people suffering from boils. A tonic wine is prepared from the bark.

Note: The new leaves and flowers usually appear together, but the shedding of the leaves varies with the individual, age, and situation. The leafless period is usually very brief and on this account the Neem is a good shade tree.

76. KADAD

Garuga pinnata Roxburgh. (Order: *Burceraceae)*.

Garuga is derived from the Telengi name of the tree, *Pinnata* in allusion to the pinnate character of the leaves.



Description: A deciduous tree reaching 50 ft. bark pealing off in flakes. Leaves imparipinnate, 6-18 in. long; leaflets 6-10 pairs and an odd one, opposite or nearly so, 3-6 in. long, lanceolate, acuminate, oblique, crenate, softly hairy when young, ultimately glabrous. Flowers creamy white or yellow, in much branched, axillary tomentose pinnacles at the ends of the branches; calyx small, cupped, hairy inside; petals 1 to 5 in. long, linear-oblong, hairy outside, sparsely pubescent within, attached to the calyx tube beneath the margin of the disc, tip thickened, inflexed; disc thin, lining the calyx tube, crenate. Stamens inserted on the calyx tube at the margin of the disc between the crenatures; filaments slightly hairy. Style stout, long hairy, stigma capitate, 5 lobed. Drupes black, fleshy size of a gooseberry, edible. Stones 1-3 (usually 2) bony, rugose.

Distribution: Throughout India, Malaya and Philippines.

Gardening: Propagated by seed, but not normally cultivated.

Uses: The fruit is eaten raw, cooked or pickled. The young shoots and leaves are used as fodder, especially for elephants. Wood used for building and fuel.

Note: The leaflets commonly carry large blister-like galls which turn red and lend a touch of colour to the yellowing leaves.

77. SESBAN or AGASTA

Sesbania grandiflora Pers. (Order: *Leguminosae)*.

Sesbania is derived from the Arabic name of 5. *aegyptica* which is common to Egypt; *grandiflora* in allusion to the large and beautiful flowers—perhaps the largest of Pea family!



Description: A small soft-wooded tree attaining a height of 20 to 30 ft. Leaves compound, paripinnate, leaflets 1-1.25 in. long by 0.25 to 0.5 in. wide, elliptic-oblong, mucronate, tip and base rounded. Flowers large, pea-shaped, in short racemes in the axils of the terminal leaves. Calyx somewhat cup-shaped, two-lipped. Corolla 2 to 3 in. Standard elliptic oblong, the remainder of the petals formed into the shape of a boat. Fruit a narrow long pod reaching a foot or more long.

Distribution: Mauritius, India to North Australia. Often cultivated in gardens for the sake of its showy flowers.

Gardening: Propagated by seed.

Uses: The tender leaves, flowers and pods are eaten. Certain parts of the tree are of repute in Indian medicine.

Note: There is a variety of this plant with deep red flowers. The flowers open at dusk and are then a pale greenish white, but by morning the standard and the other parts are tinged with, or are quite pink. The flowers appear to be fertilized by bats which visit them for the nectar. The tree comes into flower early in December and continues into January.

78. KASSOD



Cassia siamea Lam. (Order: *Leguminosae).*

Cassia is the old Greek name of Dioscorides; *siamea* means pertaining to Siam.

Description: A moderate-sized tree attaining a height of 30 to 50 ft. Leaves compound, paripinnate, 6 to 12 in. long, leaflets 12 to 18 pairs, oblong in shape, somewhat leathery, 1.25 to 2.25 in. by 0.5 to 1 in. wide, tip with a small mucro (point), base rounded. Flowers in large bunches (panicles) at the ends of the branches, 8 to 16 in. long softly velvety. Sepals unequal; petals f in. long, rounded in shape; stamens 10, 7 of which are fully developed the remaining being abortive. Fruit a pod, 6 to 9 in. long by 0.5 in. broad, straight, flat.

Distribution: A native of Malayan islands; Indo-China. Frequently cultivated in India as a roadside tree.

Gardening: Propagated by seed.

Uses: The flowers are eaten in curry. The wood is used in Burma for mallets, shelves and walking-sticks because of its hardness and durability.

Note: The leaves are said to emit a foetid odour after rain and according to one of the Malayan names, *Busuk-Busub* refers to this characteristic. The flowers appear in profusion towards the end of the rains and continue to do so for a considerable time after.

79. THE INDIAN LABURNUM or AMALTAS



Cassia fistula Linn. (Order: *Legwninosae).*

Cassia is the old Greek name of Dioscorides; *Fistula* means a pipe, in allusion to the shape of the fruit.

Description: A moderate-sized deciduous tree attaining a height of 40 to 50 ft. Leaves compound, paripinnate, 9 to 20 in. long, leaflets 4 to 8 pairs, opposite, egg-shaped or ovate-oblong, 2 to 5 in. long by 1.5 to 3.75 in, wide, tip acute, base cuniate. Flowers large, in lax pendant racemes, as long or longer than the leaves, pedicels 1.5 to 2 in. long, slender. Calyx short, corolla composed of five large showy unequal obovate, clawed petals. Stamens 7, 3 as long as the style, the remaining 4 shorter than the petals. Fruit a pod, 1 to 2 ft. long by 0.75 to 1 in. in diameter, indehiscent, with 40 to 100 seeds embedded in a dark-coloured sweetish pulp. Each seed is completely separated from its neighbour by transverse partitions.

Distribution: Common throughout the deciduous forests of India ascending to 4,000 ft. in the Himalaya; also in Ceylon.

Gardening: Propagated from seed. The seeds germinate with some difficulty, but seeds which have been kept a year or so germinate more readily. The seedling should be transplanted in the second year.

Uses: The bark is used as a tan and as a drug- The pulp of the fruit is used as a safe purgative, but it does not keep well. The pulp is also largely used in Bengal especially, to flavour tobacco. The Santals use the flowers as an article of food. The wood is very durable but owing to its small diameter is rarely of use except for posts, darts, and agricultural instruments and rice-pounders.

Note: The flowers appear from February to June and some individuals flower twice during a year—in September and October again.

80. PINK CASSIA



Cassia renigera Wall (Order: *Leguminosae).*

Cassia is the old Greek name of Dioscorides, *Renigera* meaning kidney-shaped, refers to the kidney-shaped stipules at the base of the leaves.

Description: A small deciduous tree reaching about 30 ft. Leaves compound, simply paripinnate, 4 to 14 in. long, leaflets opposite, 8 to 20 pairs, 1.5 to 2 in. long by 0.25 to 0.5 in. wide, oblong, softly downy to the touch. A large kidney-shaped bract is present at the base of the leaf-stalk of the young leaves, it falls off later. Flowers large, arranged in bunches along the branches. Pedicles long and slender, sepals 5, short, petals 5, large and showy. Fruit an indehiscent pod, 1 to 2 ft. long by 0.75 to 1 in, wide, internally divided by transverse partitions *(septa).*

Distribution: Indigenous to the dry zone of Burma, now introduced into India and Malaya. Frequently cultivated for the beauty of its flowers.

Gardening: This Cassia is not long-lived, but it grows rapidly. It flowers in the fourth or fifth year after planting. Grown from seed. It thrives well both in dry and moist climates, and can exist on a comparatively poor soil. The trunk is especially liable to the attack of wood-boring moths and should be carefully watched and attended when damage is discovered.

Uses: None known.

Note: When in flower this Cassia is a magnificent sight as the bunches of flowers are spread along the branches. The flowers appear just before the monsoon. As soon as the first showers fall much of the beauty of the tree is lost and it passes into leaf.

81. HORSE CASSIA



Cassia grandis Linn. F (Order: *Leguminosae).*

Cassia an old Greek name of Dioscorides, *Grandis* in allusion to the beauty of the tree when in full bloom.

Description: A deciduous tree reaching 30-40 ft. Leaves 10-20 in. long, paripinnate; leaflets 10-20 .pairs, oblong abruptly rounded at both ends, the apex with a minute point, particularly when young; the terminal leaflets when young are coppery — a distinctive character — leaflets l.5-2 in. long by 0.5 -0.75 in. wide. Flowers in short racemes arising from the axils of the fallen leaves; petals almost equal, rose pink; stamens in two bundles, 3 short and three long and curved. Fruit about one foot long, stout with transverse ridges between the sutures, indehiscent. Seeds 0.5-0.75 in, creamy, almond-shaped.

Distribution: Tropical America. Introduced into many tropical countries for its beauty.

Gardening: Grown from seeds. An ornamental free flowering in India between February and March.

Uses: The bitter pulp of the fruit is used as a purgative.

82. TAMARIND or IMLI



Tamarindus indica Linn. (Order: *Leguminosae).*

Tamarindus is derived from the Arabic name *tamar-Hindi* meaning Indian Date; *indica,* pertaining to India.

Description: A large deciduous tree reaching 100 ft. in height with a large spreading crown. Leaves compound, paripinnate, 2 to 5 in. long; leaflets 10 to 20 pairs, 0.3 to 1 in. by 0.2 to .33 oblong, rounded at both ends. Flowers in few-flowered racemes at the ends of the branchlets. Calyx 0.5 in. long. Sepals 4, ovate-lanceolate, tip acute. Petals only 3 developed, ovate-lanceolate, somewhat wrinkled along the margins, pink-lined. Stamens only 3 developed. Fruit a pod, 3 to 8 in. long by 0.75 to 1 in. wide, somewhat flattened, scurfy, curved, and constricted at intervals. Seeds 3-12, ovate-oblong, truncate at both ends, compressed, smooth and shining.

Distribution: Believed to be indigenous in Abyssinia and Central Africa. Largely planted in India along roads and around villages and frequently it runs wild. Tamarind groves in forests often mark the site of deserted cultivation or village.

Gardening: Propagated by seed. Thrives only in the warmer parts of India. In the Punjab it does not ripen its fruit. It is one of the commonest village trees in Burma, but in the dry zone.

Uses: The timber is hard and close-grained and is used for rice-pounders, oil and sugar mills, tools, furniture, and turnery. The fruit is used as an aperient and as an astringent, for making condiments and in general cooking.

Note: The young leaves and flowers appear almost simultaneously, and the transition from the old to the new foliage is, not always well defined, The pale green of the tender leaves is a beautiful sight.

83. LINGUM VITAE

Gruaiacum officinale Linn. (Order: *Zygophyllaceae).*

Guaiacum derived from a Spanish rendering of the Mexican name *hoaxacan; officinale* meaning *officinal,* used as medicine or procurable in shops or recognised in pharmacy or medicine.



Description: An evergreen tree reaching 30 to 40 ft. in height. Leaves compound, paripinnate; leaflets opposite, 4 to 6 along each rachis, obovate, stalkless. somewhat leathery, 0.5 to 1 in. by 0.5 to 0.75 in. Flowers arranged in umbelate bunches at the base of the leaves. Sepals 5, petals 5, ovate, tip acute, stamens 10. Fruits a flattened somewhat obcordate capsule, at first green, turning yellow when ripe. Seeds somewhat ovate.

Distribution: Indigenous to the West Indies.

Gardening: Propagated by seed. It thrives well in most gardens.

Uses: The bark yields a greenish-brown resin used medicinally in powders and tinctures. It is one of the ingredients of the well-known Plummer's Pills. It is acrid and stimulant and is used in various diseases. The heart-wood is greenish-brown and the sap-wood pale-yellow. It is heavy and sinks in water. It is used extensively in turnery. Ships blocks, pulleys, rulers, skittle-balls and bowls are some of the articles made from this wood.

Note: The flowers are produced in great profusion. The tree flowers towards the end of the cold season. In Bombay flowering is irregular. The brilliant blue flowers fade gradually to almost white before they fall. The blue is soon replaced by orange-yellow clusters as tbe fruits ripen.

84. SOAPNUT or ARITA



Sapindus laurifolius Vahl. (Order: *Sapindaeeae).*

Sapindus, a combination of two words in Latin, soap and Indian, alluding to the use of the fruit in India as a substitute for soap. *Laurifolius* means having leaves like a Laurel.

Description: A moderate-sized semi-deciduous tree. Leaves compound paripinnate; leaflets 2 to 3 pairs, nearly opposite, 3-9 by 1-4 in., lanceolate or elliptic lanceolate, tip acute or acuminate, base acute, smooth above, softly hairy beneath. Flowers small in terminal panicles covered with a rust-coloured down. Sepals 5. Petals 4 or 5, covered with silky hairs. Fruit composed of a 2 to 3 lobed fleshy drupe (often one of the lobes is suppressed), clothed with a rust-coloured down when young, and much wrinkled when dry.

Distribution: India; fairly common in open forests at low elevations in S. India; frequent in Western India and Bengal, It is often cultivated for the sake of its fruit.

Gardening: Propagated by seed. It thrives well in almost any kind of soil, particularly the drier soils. It is also planted by hardwood cuttings.

Uses: The fruit has an alkaline principle known as *saponin* which makes it useful for cleaning purposes. A semi-solid oil is extracted from the kernels of the fruits. It is used medicinally. The pulp of the fruit is at first sweet to the taste but is subsequently bitter. The root is used as an expectorant. Pessaries made of the kernel of the seed are used to stimulate the uterus in childbirth and amenorrhoea. The wood is hard and is used for building carts and a variety of small articles.

Note: The flowers appear from November to December; the fruit ripens about March.

85. AMHERSTIA or THAWKA

Amherstia nobilis Wall. (Order: *Leguminosae).*



Amherstia in honour of the Countess Amherst and her daughter. Lady Amherst, promoters of Indian botany; *nobilis* in allusion to the graceful beauty of the flowers.

Description: A moderately-sized evergreen tree attaining a height of 30 to 40 ft. Leaves compound paripinnate, 1 to 1.5 ft. long; leaflets 6 to 9 pairs, opposite, 6 to 12 in. long by 1 to £ in. wide. Flowers large, arranged in long, pendant candelabra-like racemes arising in the axils of the leaves; common peduncle 18 to 30 in. long; pedicels 3.5 to 4 in. with a pair of large leaf-like bracts above the middle; bracts 2.5 in. long by 0.5 to 0.75 in. wide, oblong-lanceolate; sepals 4, 1.5 by 0.25 in. oblong, the dorsal broader than the other three, recoiled upon themselves when the flowers open. Corolla, petals only 3 developed (the standard, and the two wing petals), standard large, erect, obovate or obcordate, lateral petals oblanceolate, tips rounded. Stamens 9, joined into a bundle, 4 shorter than the remaining five, recurved ones. Style thread-like, as long as the free stamens. Fruit a flat pod, 4 to 7 in. long by 1 to 1.5 in. wide, beaked.

Distribution: Mataban, Tenaserim, Burma.

Gardening: Propagated from seed or by cuttings. It thrives in a rich soil and a warm moist climate. The trees need to be protected from strong winds, and too much direct sun.

Uses: *Amherstia* is cultivated for its beautiful flowers hi Burma, India, Ceylon and Jamaica.

Note: The chief flowering period appears to be between January and early March,

The young leaves are flaccid and pendant, and are remarkable for their beauty, being either of a rich red or purple hue, before they finally become green.

86. THE MAHOGANY



Swietenia mahogani Jacq. (Order: *Meliaceae)*.

Swietenia named in honour of G. V. Swieten, 1700 to 1772. *Mahogany* derivation uncertain.

Description: A large deciduous tree attaining a height of 60 to 80 ft. Leaves compound, paripinnate, 10 to 20 in. long; leaflets 3 to 4 (or more) pairs, very unequally sided, 2 to 7 in. long by 1 to 2.5 in. wide, opposite or nearly so, tip acute or acuminate. Flowers small, arising in small panicles in the axils of the leaves. Sepals 5, very small. Petals 5, ovate-oblong, tip rounded. Stamens 10, filaments united into an urn-like bowl, the staminal column, anther within the column. Style short, surmounted by an umbrella-like stigma. Ovary arising from a scarlet disc, the nectaries. Fruit large, head, woody, ovate, 2-3.5 in. long by 2-2.5 in. broad at its widest; carpels 5; seeds winged.

Distribution: Indigenous to Tropical North and South America and West Indies.

Gardening: It is propagated by seed. The Mahogany is planted as a roadside tree in some areas in India. It requires a rich soil and will flower early.

Uses: The tree yields the well-known Mahogany wood of commerce. It is a dark-red hard wood used for furniture, etc.

Note: The tree is often described as evergreen but I have always noted it to be entirely deciduous or semi-deciduous in this country. When the leaves fall they become a coppery brown. In flower the ground below the tree is carpeted with the green blooms and the air is permeated with the odour of the flowers. The name, Mahogany, is frequently applied to the wood of other members of the *Meliaceae,* but strictly, this species is the true Mahogany.

87. VEDI-BABHAL or JERUSALEM THORN



Parkinsonia aeuleata Linn. (Order: *Leguminosae)*.

Parkinsonia in honour of John Parkinson (1567-1650) a British apothecary. *Aculeata,* from Latin *aculeus,* a small needle, in allusion to the sharp woody spines.

Description: A large glabrous bush or small tree 10-20 ft. armed with sharp woody spines. Leaves apparently simple pinnate, but in reality bi-pinnate from a very short rachis, two pinnae take the form of spines, the third, the form of the 'simple' pinnate leaf, 6-14 in. long; leaflets numerous, small, oblanceo-late, obtuse, shortly stalked. Flowers in axillary racemes, shorter than the leaves; pedicels 3/8 to 3/4 in. long, slender, jointed near the tip; calyx of 5 sepals, divided nearly to the base, oblong; petals 5, ¾ to 7/8 in., bright yellow, ovate or suborbicular, with a short hairy claw; filaments flattened, densely hairy at the base. Pod 2-5 in. by 0.25-0.5 in. moniliform, pointed at both ends, glabrous. Seeds 1-6 in each pod.

Distribution: Probably Tropical America, Introduced into India and has become naturalised in many areas.

Gardening: Propagated by seed. It forms a suitable hedge.

Uses: Nothing known.

88. BABAL or BABHUL

Acacia arabica Willd. (Order: *Leguminosae).*

Acacia from Latin *acus,* needle, in reference to the spines. *Arabica,* pertaining to Arabia, the country from which it was first described.



Description: A small spreading very spiny tree, 20-40 ft. with dark brown longitudinally fissured bark. Leaves bipinnate, 2-5 in. long, main rachis downy, often having glands; petiole 1-2 in. long, leaflets small very numerous; stipular spines variable 0.25-3 in. long, greyish white, smooth, straight, sharp; pinnae 4-9 pairs, 0.75 - 2 in. long; leaflets 10-25 pairs, 0.125 – 0.25 in. long. Flowers small, arranged in fluffy round heads, yellow; peduncles in fascicles of 2-6; calyx minute, cupped; corolla with short triangular lobes. Pods 3-7 in. by 0.5-0.625 in., moniliform, flat, grey downy; seeds 8-12, flat.

Distribution: Throughout the greater part of India, Ceylon, Arabia, Egypt, and Tropical Africa.

Gardening: Propagated by seed (seldom planted in gardens), selfsown in many areas. Makes an unpenetrable fence. The plant is salt tolerant and grows near the sea, even along salt marshes.

Uses: Almost every portion of the tree is used for various purposes. The gum is used medicinally and by calico-printers and as a substitute for *gum arabic.* The green portions of the plant and its fruit form a valuable fodder in arid areas. The timber is hard and durable, extensively used for wheels and well curbs and largely for fuel. The young branches are used as tooth brushes and are sold in the markets.

89. THE GUL MOHUR

Delonix regia Raf. (Order: Leguminosae).

Delonix derivation uncertain. Regia means regal, in allusion to the flowers.



Description: A fairly large deciduous tree attaining a height of about 60 ft. Leaves compound, bipinnate, 1 to 2 ft. long, pinnae 11 to 18 pairs, with small leaflets varying from 20 to 30 pairs in number arranged along their length. Flowers large with spreading 'racket-shaped' petals in large bunches along and at the ends of the branches. Sepals 5, thick, green outside and red within, reflexed in the open flower, petals 5, one differentiated in colour from the others, corresponding to the standard. Stamens 10 grouped round the style. Fruit a pod or bean, 1 to 2 ft. by 1.5 wide, flat, ending in a short beak. Seeds about 1 in. arranged transversely in sockets between the two halves.

Distribution: The Gul Mohur is a native of Madagascar. It was introduced in India within the last hundred years.

Gardening: The tree may be propagated by seed or by cuttings. It thrives well in good soil especially under fairly dry conditions, near the sea. Pruning the crown must be judiciously done if good results are required. The root system is frequently very shallow often resulting in the tree being easily blown down.

Uses: The flowers and buds are used as a pot herb, and eaten like spinach.

Note: There is a considerable variation in the intensity of the red of the flowers in different individuals. The pod remains on the tree till the end of the next dry season. The Gul Mohur was usually known as Poinciana regia but the true Poinciana is an American genus and therefore cannot be used.

90. COLVILLE'S GLORY

Colvillia racemosa Bojer. (Order; *Leguminosae).*

Colvillia is named in honour of Sir Charles Colville, once Governor of Mauritius. *Racemosa* refers to the arrangement of the flowers, in racemes.



Description: A moderate-sized tree, 40 to 50 ft. high, much resembling the Gul Mohur when not in flower. Leaves compound, bipinnate, 20 to 30 pinnae on the rachis and from 20 to 28 pairs of small leaflets opposite each other along the pinnae. Flowers in large pendant racemes at the ends of the branches. Sepals more or less obliquely shaped and sharply pointed, softly silky to the touch. Petals 5, the standard reduced to small size, the 2 lateral petals are larger and the 2 remaining petals go to make up a feeble keel. Stamens 10, large and prominent. The fruit, a pod, is two-valved and round in section.

Distribution: It is supposed to be a native of E. Africa, but it was discovered by Bojer on the W. Coast of Madagascar, where a single tree was cultivated by the natives.

Gardening: Propagated from seed. It is able to withstand a moist or moderately dry low country. Though worthy of cultivation this tree is seldom seen outside botanic gardens. As the racemes are terminal, i.e., at the ends of the branches, the tree should not be indiscriminately pruned.

Note: In India the tree flowers between the end of June and August, but in Madagascar in April or May. I have not seen fruiting specimens in India.

91. THE COPPER POD

Peltophorum inerme (Roxb.) Llanos. (Order: *Leguminosae).*

Peltophorum is a Greek derivation meaning shield-bearer, in allusion to the shape of the pods; *inerme* is derived from the Latin word *inermis,* meaning unarmed.



Description: A large deciduous or partially deciduous tree with dark handsome foliage. Leaves compound, bipinnate, 6 to 20 pinnae each with 20 to 30 leaflets arranged along their length, leaflets small. Flowers arranged in large panicles at the ends of the branches. Calyx composed of 5 sepals, petals 5, obovate, crinkled as if made of crinkled paper. Stamens 10, not united. Fruit a pod, 2 to 4 in. long by 0.75 to 1 in. wide, oblong, flat, thin and hard, narrowed at both ends, 1 to 4 seeded.

Distribution: A native of Ceylon, the Andamans, the Malay Peninsula and Archipelago and N. Australia.

Gardening: Propagated either by seed or from cuttings. Growth is fairly rapid. Young trees flower early and very irregularly. The trees when in full bloom make a wonderful show of yellow against a background of dark green foliage. During the flowering season the ground is carpeted with the fallen blooms.

Uses: The timber is used for cabinet work.

Note: The general flowering period is from March to May, but sporadic flowering may continue almost throughout the year, especially in young trees. I have coined the popular name, Copper Pod, in allusion to the beautiful copper colour of the young pods.

92. BOKHAYAN or PERSIAN LILAC



Melia azedarach Linn. (Order: *Meliaceae).*

Melia, the Greek name for the tree. *Azedarach* the Persian name for the species,

Description: A small tree reaching 40 ft. Leaves, fern-like, imparipinnately bi-or sometimes tri-pinnate; pinnae 9-18 in. long, opposite or alternate, leaflets 3-11 opposite or nearly so 0.5-2 in., ovate, lanceolate acuminate, bluntly serrate, sometimes lobed, glabrous, unequally sided. Flowers in long axillary panicles, shorter than the leaves, lillac in colour. Calyx with 5 or 6 sepals divided nearly to the base, segments ovate-oblong, acute, slightly hairy; petals 5 or 6, 5/8 in. long oblong-lanceolate; stamens forming a 20-toothed staminal tube, faintly ribbed outside, anthers sessile, 10, between the teeth. Fruit an ellipsoid-globose drupe, 4-5 seeded.

Distribution: Sub-Himalayan tract of India; Persia and China.

Gardening: Propagated by seed. The tree is frequently cultivated, and planted along roadside on account of its beautiful foliage and profusion of scented flowers.

Uses: The tree has some repute in medicine. The root is used as an antihelmentic. The seeds yield valuable oil; they are occasionally bored and used as beads. The mature wood is hard and handsomely marked.

Note: The tree is also referred to as the Bead Tree.

93. JACARANDA

Jacaranda mimosaefolia D. Don. (Order: *Bignoniaceae).*



Jacaranda, a Brazilian vernacular name. *Mimosaefolia* in allusion to its feathery mimosa-like leaves.

Description: A tree with fern-like foliage reaching 40-50 ft. Leaves alternate, bipinnate, 9-16 or more alternate or nearly opposite pinnae each bearing 14-24 pairs of small opposite or subopposite, finely-pointed leaflets 0.25-0.3 in. long, the terminal one larger. Flowers numerous in open panicles at the ends of the branches; corolla tubular, two-lipped, upper lip two-lobed; lower three-lobed. Stamens 4, short with narrow erect anthers; style as long as the corolla with a mop-like stigma. Fruit an oblong, ovate or circular flat, woody capsule, dehiscent. Seed winged.

Distribution: A native of Brazil, Introduced into many countries on account of its delicate beauty.

Gardening: Propagated from seed or by cuttings of half-ripened wood.It stands up to judicious pruning and be kept in regular form It makes good avenues.

Uses: Jacaranda is used medicinally in South America. An infusion from the leaves is administered for chest complaints; powdered leaves are used for treating wounds. Infusions from the bark and leaves are administered in the treatment of mucous discharges and syphilis.

94. CORAL-WOOD or RATAN-GUNJ



Adenanthera pavonina Linn. (Order: *Leguminosae*).

Adenanthera in allusion to the deciduous stalked gland on each anther; *pavonina* derived from the Latin for peacock, probably in preference to the leaves.

Description: A handsome deciduous tree, 20 to 60 ft. high. Leaves compound, bipinnate, 8 to 18 in. long, with 3 to 6 pairs of pinnae, opposite, 3 to 7 in. long, leaflets 4 to 8, 1 to 1.5 by 0.33 to 1 in., papery, elliptic or elliptic oblong, tip blunt, base cuniate. Flowers in stalked racemes 2 to 9 in. long in the axils of leaves or at the ends of the branches, much resembling a thin bottle brush. The individual flowers are small with 10 stamens each. Fruit a pod, 6 to 9 in. long by 0.75 in. wide, flat, curled when dry. Seeds the shape of a lentil, 0.33 in. across, smooth and shining.

Distribution: The eastern sub-Himalayan tract, Burma, the Andamans and the Western Ghats. Often planted, especially in Southern India.

Gardening: The tree requires a moist climate to thrive well, and can be grown from large cuttings put down in the monsoon. The seeds germinate with some difficulty unless kept moist for some days before sowing.

Uses: A gum is produced by the tree. The wood is powdered and used as a dye. A paste, known as *tilak,* is made from the wood. The timber is much employed for building and for cabinet making. A decoction made from both the seeds and the wood is used in pulmonary affections, and as an external application in chronic ophthalmia. The seeds are sometimes eaten. They are also made into rosaries and are used as weights; ground to a paste with borax they form a useful cement. The seeds are known as ‘Circassian seeds.’

Note: The tree is referred to as the Red-Wood, and occasionally as the Red Sandal-wood or Coral-wood.

95. THE RAIN TREE



***Samanea Saman** Merill. (Order: *Leguminosae*).

Samanea is derived from a corruption of the native Spanish name of *zaman.*

Description: A large deciduous tree with a spreading crown attaining a height of 50 to 70 ft. Leaves compound, bipinnate, pinnae 6 to 8 pairs, opposite, leaflets 4 to 8 pairs, opposite, the terminal pairs being the largest, somewhat unequalsided, tip blunt, base somewhat narrowed. Flowers arranged in axillary or terminal bunches, small with long, thread-like stamens (a number of flowers are clustered together on a common peduncle and to the unwary may be mistaken for a single flower). Calyx and corolla tubular, stamens 10, threadlike, *(filiform).* Fruit a pod, 6 to 10 in. long by 0.75 to 1 in. broad, fiat, indehiscent, containing a sweet pulp surrounding the seeds.

Distribution: The Rain Tree is a native of Central America and the West Indies, but it is widely cultivated throughout the tropics. It was introduced into India from Jamaica.

Gardening: Propagated by seeds and cuttings. Growth is very rapid. It will not stand the cold of Northern India.

Uses: The sweet pulp contained in the pods are eagerly eaten by cattle and horses. The seeds are usually not digested. The pods when fed to cows is believed to increase the quantity of the milk.

Note: The popular name ‘Rain Tree’ may have been derived from the fact that the leaves fold on the approach of rain and thus act as an indicator — there are other trees that do likewise. There is also a drip of nectar from the flowers and ripe pods.

*The old name was ***Pithecolobium Saman***

96. MANILA TAMARIND



Pithecolobium dulce Benth. (Order: *Leguminosae).*

Pithecolobium is derived from two Greek words, meaning monkey and ear-ring, in allusion to the twisted, pendulous fruit. *Dulce* in Latin, is in reference to the sweet pulp *(aril)* of the fruit.

Description: A middle-sized evergreen, prickly tree attaining a height of 40 to 50 ft. Leaves compound, composed of two pinnae each bearing 2 leathery, unequal-sided, usually obtuse leaflets, 1 to 2 in. long by 0.5 to 0.75 in. wide. Flowers in rounded, cottony heads arranged in panicle racemes at the ends of the branches, racemes erect or pendulous, Fruit, a somewhat spirally twisted pod, 4 to 6 in. long, with constrictions between the seeds. Seeds black, embedded in a creamy coloured pulp (the *aril).*

Distribution: Indigenous in America, Mexico, Philippines. Widely cultivated throughout the tropics as an ornamental tree.

Gardening: Propagated from seed or by cuttings. It grows rapidly and stands pruning well. It is frequently used as a hedge,

Uses: The pulpy *aril* of the seed is eaten by the poorer classes as a food (America). The bark yields a yellow dye. The tree yields a gum. The seeds yield clean fatty oil. The wood is used for carts, packing cases and the panelling of door.

Note: The flowers appear about, November and the tree carries on flowering right into the hot weather. The pulp though somewhat sweet leaves a somewhat foul odour in the mouth.

97. SIRAS or LEBBEK TREE



Albizzia lebbek Benth. (Order: *Leguminosae).*

Albizzia: in honour of an Italian naturalist, Albizzi. *Lebbek,* the origin is not clear,

Description: A deciduous tree reaching 40-70 ft.; bark pale. Leaves abruptly bipinnate; main rachis pubescent of glabrous, with a large gland on the petiole above the base and one below the uppermost pinnae, pinnae 2, 3 or 4 pairs, 4-5 in. long; leaflets 5-9 pairs, 1-1.75 in. by 0.6 – 0.75 in. with glands between their bases, the lateral leaflets elliptic-oblong, the two terminal obovate-oblong, all unequal sided. Flowers creamy white, scented, in globose umbellate heads 0.75-1.5 in. in diameter (not including stamens); calyx small with triangular teeth; corolla tube 0.37 in.; filaments united at the base into a short tube, long. Pod 4-12 in. by 0.75-1.75in., linear oblong, pointed, pale straw coloured, papery, markedly veined, smooth shinning. Seeds 4-12, ellipsoid-oblond, flat, depressions on the faces, pale brown.

Distribution: Tropical and Subtropical Asia and Africa; frequently planted.

Gardening: Propagated by seed.

Uses: The wood is excellent and is shipped to London where it is known as E, Indian Walnut. It is used for building canoes, furniture and picture frames.

Note: The incessant rattling of the dry pods in the lightest breeze has earned for the tree the name of "The Woman's Tongue'.

98. PHARRAI

Oroxyhun indicuni Vent. (Order: *Bignoniaceae).*



Oroxylwn is derived from a combination of two Greek words referring to it as a 'mountain tree.' (It is found from sea level to 3,000 ft.) *Indicum* means pertaining to India.

Description: A small deciduous tree occasionally reaching about 35 to 40 ft., seldom branching. Leaves decompound, 3 to 5 ft. long, tripinnate, with opposite pinnae, leaflets large, 2.5 to 5 in. by 1.5 to 4 in., egg-shaped or elliptic, tip acuminate, base rounded or sometimes cordate (heart-shaped), rachis very stout, spotted with raised points *(lenticels).* Flowers large, arranged on a long, erect peduncle, over-topping the crown of leaves, 2 to 4 ft. long. Calyx 1 in. long, cupped; corolla reaching 4 in. long by about 3 in. across, thick and fleshy, with much wrinkled edges, ill-smelling. Stamens 5, style long with a stigma of two small leaf-like segments. Fruit a capsule, 1 to 3 ft. long by 2 to 4 in. wide, flat, shoe-like in shape tapering at both ends. Seeds very numerous, 2 to 2.5 in. across, including the papery wing.

Distribution: The pharrai occurs throughout the greater part of India and Burma, in the Andamans and Ceylon. In the sub-Himalayan tracts it ascends to about 3,500 ft.

Gardening: Propagated from seed and also by transplanting the root-suckers.

Uses: The bark and fruits are used as a mordant in tanning and dyeing. The root bark is used medicinally.

Note: The flowers appear during the rains. When first open they are a pale green, gradually passing to purples and dirty browns before they fall; very strongly scented—over-powering, but not really unpleasant. They are visited by the smaller fruit bats which are probably the pollinating agents. The fruit remains on the tree till the next hot weather.

99. THE DRUMSTICK TREE or SOHNJA

Moringa oleifera Lamk. (Order: *Moringaceae).*



Moringa is derived from the Tamil name for this tree. *Oleifera* is a combination of two Latin words meaning oil-bearing.

Description: A small deciduous tree with brittle stem and branches and corky bark, 15 to 30 ft. high. Leaves decompound, tripinnate, 1 to 2 ft., leaflets 0.5-0.75 in. by 0.25-0.5 in., the lateral somewhat elliptic, the terminal obovate and slightly larger than the lateral ones. Flowers arranged at the branches. Petals 5, star-shaped or spatulate, unequally sized. Stamens 5. Fruit bean-like, 1 to 1.5 ft., tapering at both ends, 9-ribbed. Seeds round with 3 papery wings.

Distribution: It is indigenous to the Western Himalayas and Oudh. It is cultivated throughout India and other tropical countries.

Gardening: The Drumstick grows easily from both seeds and from cuttings. It is fast-growing.

Uses: The tree yields a gum belonging to the tragacanth group. The seeds yield clear, almost colourless oil which is much valued as a lubricant, and is also used in perfumery. Almost every portion of the plant is of value as an article of food. The roots form a well-known horse-radish—a name often applied to the tree. The oil is commercially termed Ben oil.

Note: There are several varieties of Drumstick: one with somewhat curly fruit is considered best (Bombay), while the one which is strongly 3-angled is not favoured or used. The common shape is the one that is almost round in cross section.

100. THE INDIAN CORK TREE OR AKAS NIM

Millingtonia hortensis Linn. *fil.* (Order: *Bignoniaceae).*

Millingtonia in honour of Thomas Millington, an English botanist: *hortensis* in Latin means, growing in gardens.



Description: A tall evergreen tree with a straight trunk reaching 80 ft., with drooping branches and dark foliage. Leaves compound, 2 to 3-pinnate, 10 to 20 in. long; leaflets 1 to 2.5in. by 0.75 to 1.5 in. wide, very irregularly shaped, but with a general tendency to ovate or ovate-lanceolate, tip acute or acuminate, base rounded, truncate, or cuniate, or even cordate; margins serrate, dentate, crenate, or entire. Flowers irt terminal panicles; calyx small, tubular, corolla long and tubular ending in five ovate segments, tube 2 to 3 in. long. Stamens 4, lying on the two lower petals. Fruit slender, flattened and pointed at both ends, 1 to 1.5 ft. in length.

Distribution: Believed to be indigenous to Burma, from Ava to Tenasserim, and the Malay Archipelago. It is much cultivated in many parts of India and runs wild in certain parts of Central India as in the valley of the Godavari River.

Gardening: Propagated by seed. The Cork Tree is very ornamental and is much used in Western India as a roadside tree. It is a hardy plant, but the wood is soft and brittle, and the trunk snaps off readily in high wind. The seeds should be sown soon after the fruit ripens, and the seedlings transplanted during the rains. The tree may be propagated by root-suckers or by cuttings also.

Uses: The wood is used for furniture and ornamental work. The bark yields an inferior cork.

Note: The flowers are fragrant and carpet the ground beneath the tree. In Western India the Cork Tree does not bear fruit.

END